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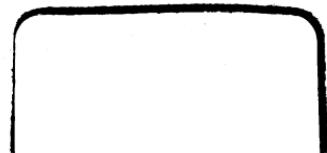
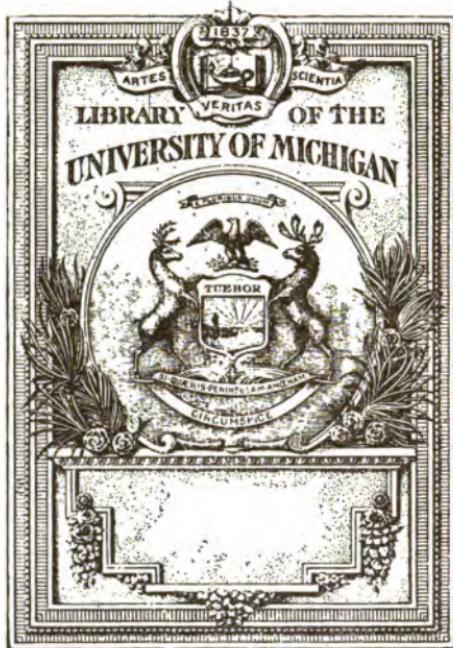
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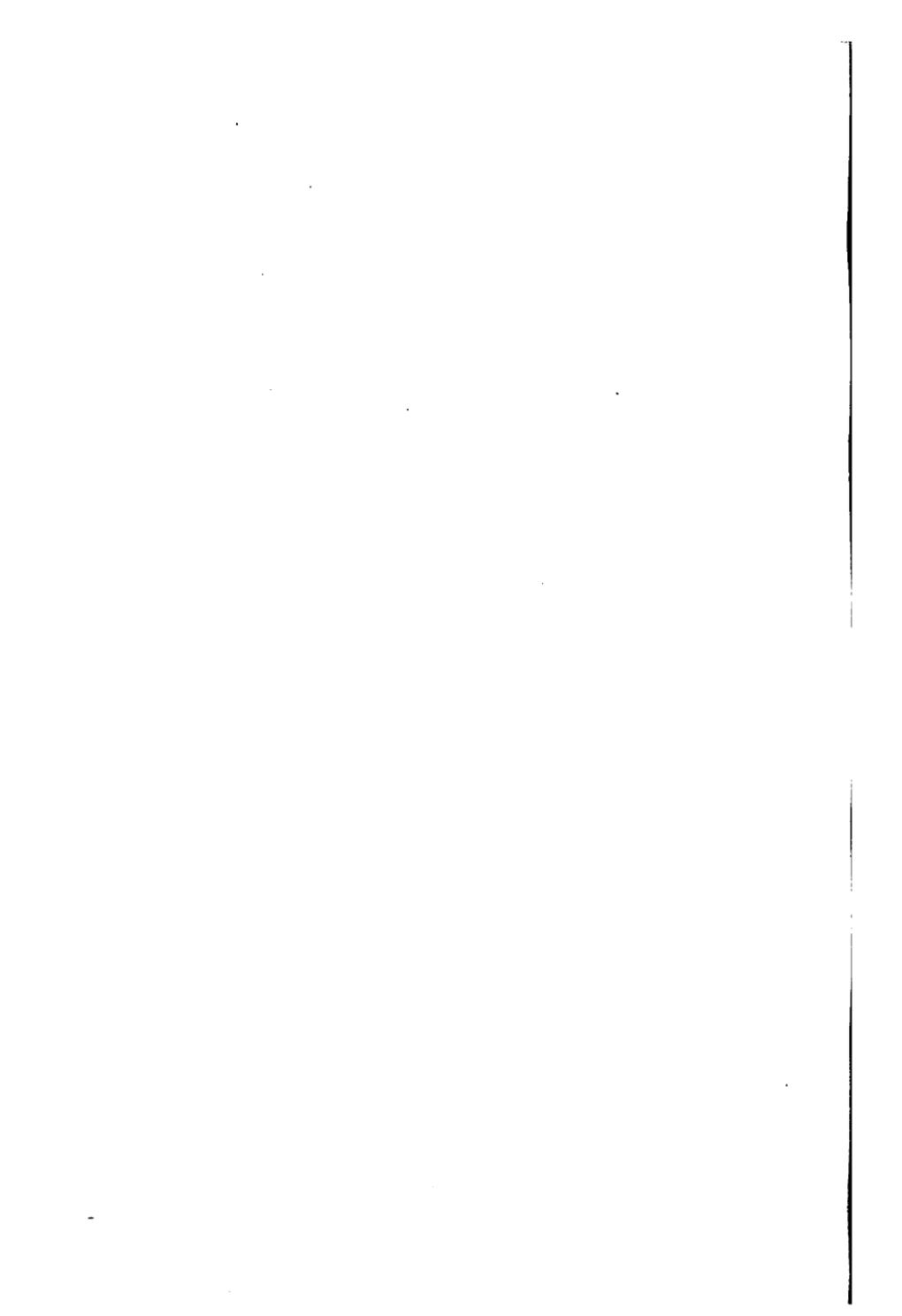
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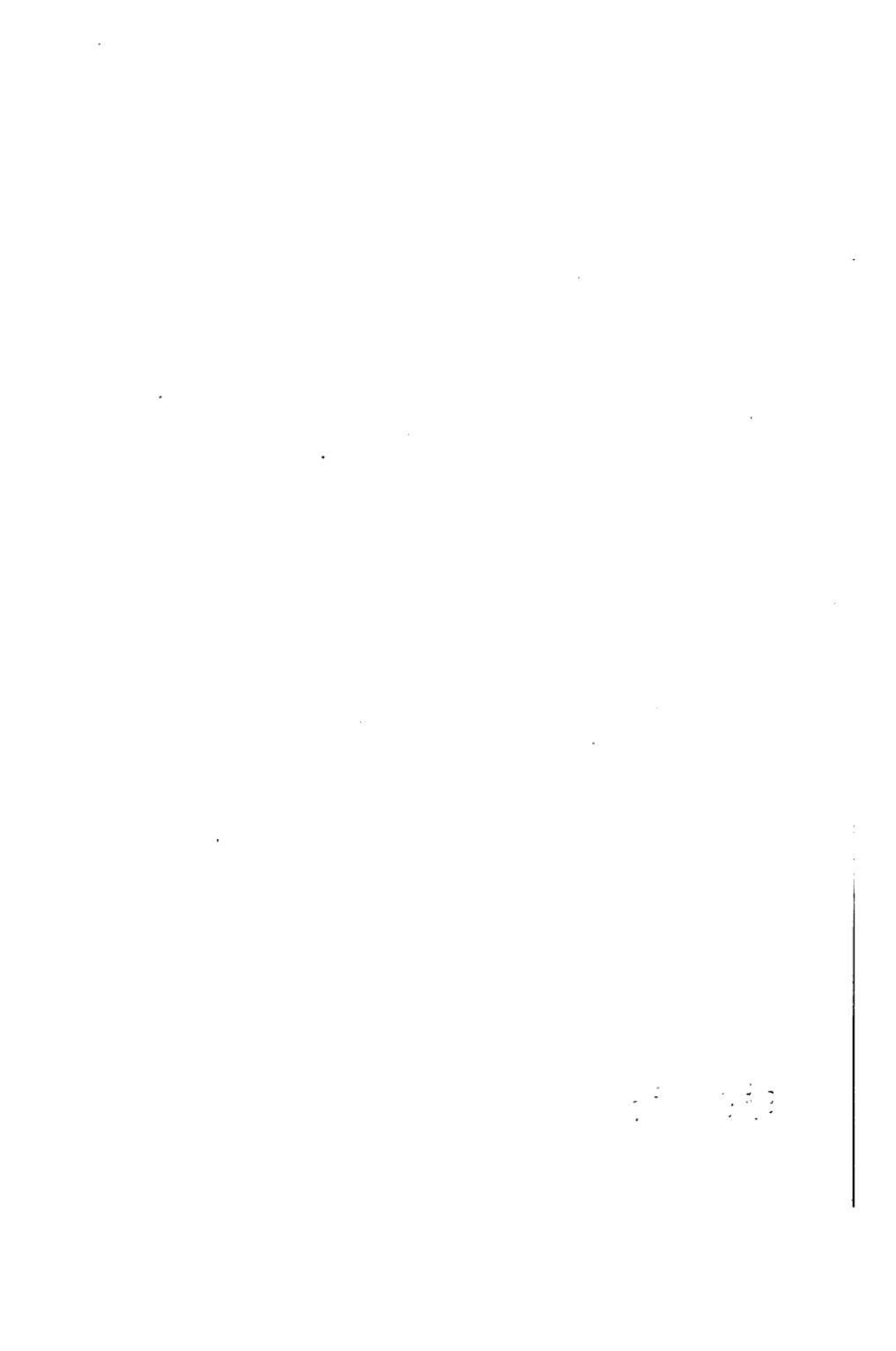


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**Dr. Kellogg's Lectures
on
Practical Health Topics**





J.H. Kellogg

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Dr. Kellogg's Lectures

on

Practical Health Topics

Volume I.

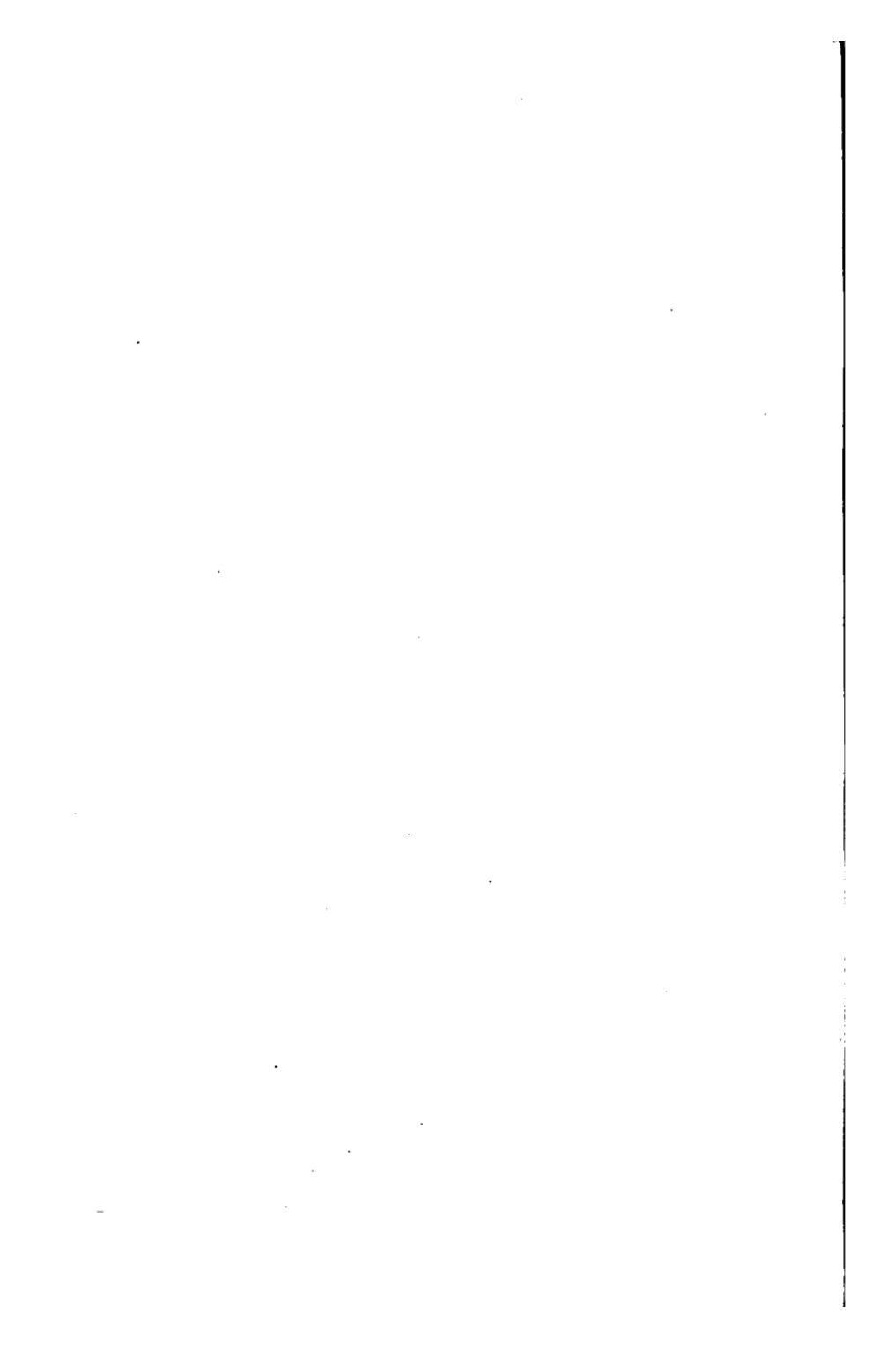
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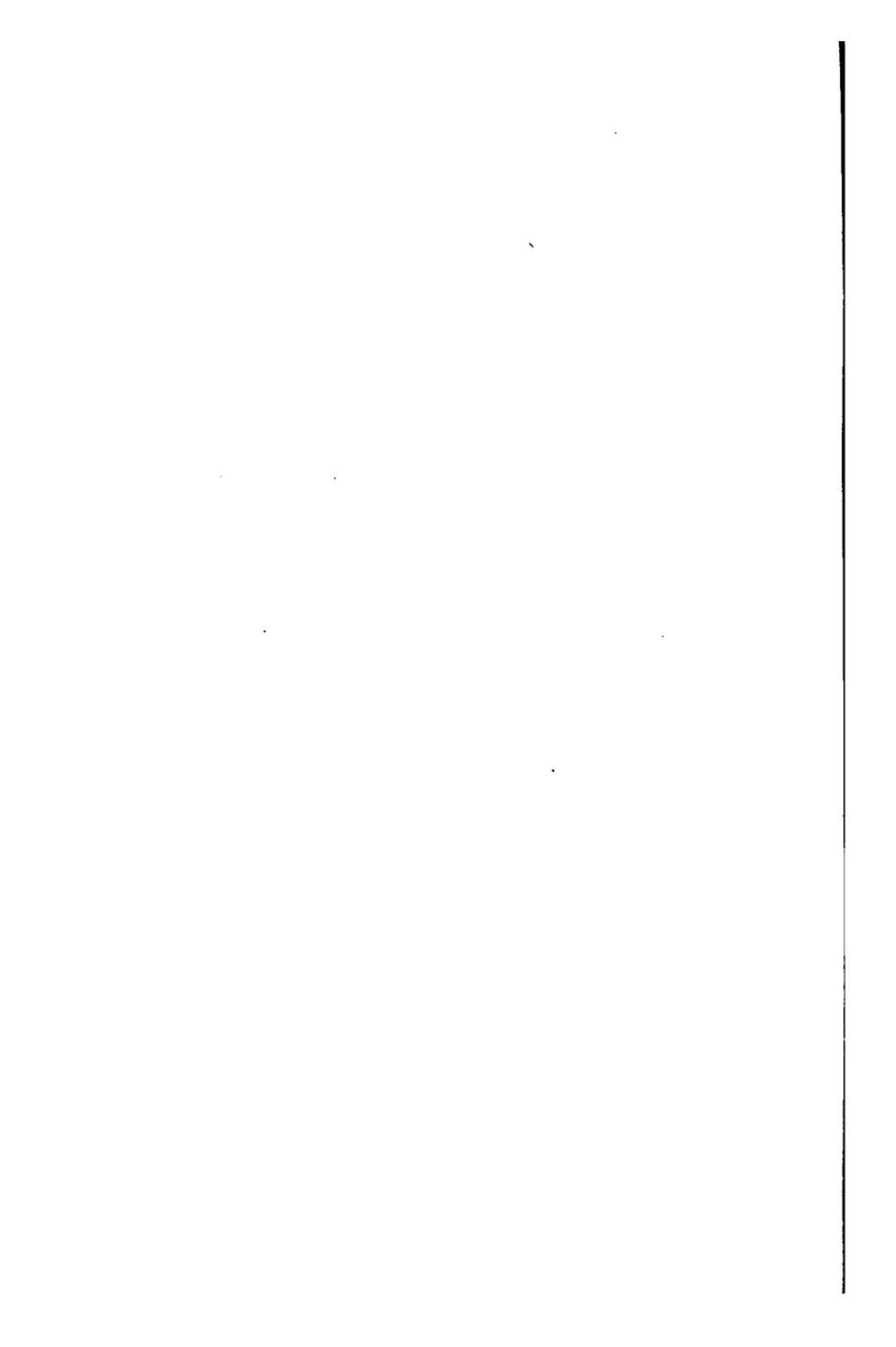
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Changing the Intestinal Flora



Changing the Intestinal Flora

PASTEUR discovered that the intestinal tract is swarming with bacteria. Strassburger and other more recent investigators have estimated the number of these organisms produced in the intestinal tract daily to be not less than 150,000,000,000,000, and doubtless the number is sometimes much greater. Pasteur believed and taught that these countless millions of minute organisms were useful and even necessary to the maintenance of the body in health, that they rendered valuable and essential assistance in the process of digestion. More recent studies, however, have shown that Pasteur was in error.

Levin, in the study of Arctic animals at Spitzbergen, showed that more than 53 per cent of the animals in that region have no bacteria in the intestinal tract. Nuttall and Thierfelder showed that guinea pigs brought into the world by Caesarian section may be made to grow without contact with bacteria.

Cohendy has quite recently shown that chickens hatched from eggs free from bacteria may be raised and made to thrive on food and drink in an atmosphere entirely free from germs. It is now clearly established that we do not live by the aid of the germs that throng our intestines and swarm upon the surface of the body, but rather that we live in spite of these microbic enemies.

Two Classes of Germs:

The germs that are ordinarily found in the human intestine may be divided into two classes; namely, fermentation germs and putrefaction germs. Fermentation germs feed upon carbohydrates; that is, starch, sugar and dextrin; while putrefaction germs feed upon protein—such substances as the white of eggs, the lean of meat, and the curd of milk. Roughly speaking, we may say that fermentation germs feed upon vegetable and putrefaction germs upon animal substances.

These two classes of germs differ very widely in their characteristics and their relation to the human body is in each case based upon the substances which they produce by

their activity. Fermentation germs produce for the most part acids, especially lactic and acetic acids, which, in the small quantities in which they are produced in the body, are practically harmless. Putrefaction germs, on the other hand, produce by the decomposition of proteins, especially when acting upon animal proteins, highly poisonous toxins, many of which closely resemble the venom of snakes and which are capable of producing in the most minute quantities the most alarming and distressing symptoms.

Poisoning From Putrescible Colon Contents

A good illustration of the ill effects of minute doses of these poisons is found in the unpleasant symptoms experienced by contact with putrescible substances; for example, the odors arising from a dead rat in a closet or under the floor, although greatly diluted with air, may give rise to headache, loss of appetite, nausea, and other unpleasant effects. The sickening effects of the odors arising from the fecal discharges of a dog or cat, or of a person accustomed to the free use of meat, clearly demonstrate the potency of

these subtle poisons. The bowel discharges of a meat-eater, exposed in a closed room, would in an hour or two render the place intolerable, even to a very robust person. The writer has known vigorous young men to be made very ill with violent attacks of headache through a few hours' contact with such material in laboratory work. A moment's consideration will show that such corrupt and putrescent matters must be capable of producing much greater mischief when in the body than after removal from it. If the mere breathing of the greatly diluted volatile poisons arising from such putrescent matter will produce highly unpleasant effects, how much more grave must be the effects when through the retention within the body of these foul substances all of their poisonous contents are absorbed and sucked up into the blood and circulated throughout the body! In other words, when a person through constipation throws off through the lungs, kidneys and skin a large part of the poisonous matters which ought to have been discharged through the bowel, how great must be the mischief done! There is abundant reason

for believing that the poisoning of the body, or so-called autointoxication, which results from the absorption of poisons from the intestine, is the chief cause of most chronic diseases and of premature senility and decay, as well as a very potent and predisposing cause of most acute maladies.

Beneficent or Protective Germs

Normal human beings are born into the world entirely free from bacteria. Not a single germ is found in the interior of the new-born infant. Within a few hours after birth (four to six hours in summer, and twenty hours in winter) the intestines of the infant are found to be swarming with bacteria, the study of which, by Tissier, Escherich and numerous other investigators has shown to be of the harmless sort—namely, the fermentation germs or acid-formers. It is the presence of these germs that gives to the stools of a healthy young infant a slightly acid odor. A portion of the bowel discharges of the young infant added to milk does not cause putrefaction of the milk, but simply souring or fermentation.

These acid-forming germs play a protective rôle. Thanks to their presence in the intestine, the putrefaction germs cannot thrive, for these organisms cannot grow in the presence of acids. An alkaline medium is needed to promote their growth. Hence, so long as acid-forming germs keep possession of its intestine the infant is safe from the destructive effects of the putrefaction germs, or poison-formers, which are the cause of diarrhea and most other infant troubles. When by the use of cow's milk (that is, ordinary commercial milk), or by other errors in feeding, such as the giving of meat or eggs, overwhelming numbers of putrefaction germs are introduced into the intestine and the infant's stools become dark-colored and bad-smelling, then the experienced mother or nurse, as well as the doctor, knows that the child, if not already sick, will soon be sick, and the sickness will be due to the poisons produced by these enemies of life, the germs of putrefaction.

As the child advances in years the putrefaction germs increase in number in the intestine. Through the use of meat, highly

active putrefaction germs are introduced into the intestine and grow and multiply in great numbers, so that the stools become very offensive and chronic autointoxication results. The consequences are constipation, colitis, so-called biliousness, gastritis, inflammation of the gall ducts, gall stones, skin diseases of various sorts, neurasthenia, and after some years Bright's disease, hardening of the arteries, high blood-pressure, apoplexy, paralysis, insomnia, mental depression, and even insanity.

The Cause of Old Age

Metchnikoff has clearly proved that these putrefaction germs are the cause of early senility, premature old age and death. Among the worst of the putrefaction germs which are commonly found in the intestine in the diseased condition of adult life are the *bacillus coli*, Welch's bacillus, *bacillus proteus*, *bacillus subtilis*, *streptococcus*, *enterococcus*, *bacillus putrificus*, *bacillus paracoli*, and sometimes the typhoid bacillus. All these germs produce most virulent poisons, and when present in the feces in large num-

bers they are certain proof of the existence of chronic intestinal autointoxication, even though the characteristic symptoms of auto-intoxication have not yet appeared. A coated tongue, a sallow complexion, large circles around the eyes, appearance of brown spots upon the hands or other parts (the so-called liver spots), offensive breath and perspiration, the discharge of foul-smelling gases from the bowels, putrid stools, thin, inelastic, parchment-like skin, dullness of mind, inability to concentrate the mind, mental irritability or depression without apparent cause, cold hands and feet, perspiration of the hands and feet, chronic headache, attacks of migraine or sick headache—these and a score of other symptoms which might be mentioned are certain indications of chronic poisoning, prompt attention to which may prevent the development of the later more serious conditions, such as hardening of the arteries, Bright's disease with albumen and casts in the urine, or apoplexy with paralysis. Grave symptoms of autointoxication do not appear until after the mechanism of the body, through which nature deals with poisons, de-

stroying and eliminating them, has broken down and failed to accomplish its purpose as a result of the overwhelming amount of work which has been thrown upon it. Hence, the appearance of symptoms of autointoxication indicate that the body has already become crippled and that the matter must receive serious and immediate attention.

Reforming the Intestinal Flora

Eminent progressive medical men the world over are rapidly coming to recognize that changing the intestinal flora is an important factor in the treatment of all forms of chronic disease, and that in the great majority of chronic diseases it is the one essential thing. Modern researches have clearly shown that the great benefit that has been known to be derived from those methods of treatments which have been most successful have really been due to the influence of these measures upon the intestinal flora.

We may mention, for example, the temporary benefit derived by the tens of thousands of persons who annually visit mineral springs, the waters of which possess laxative

properties. Such resorts are popular in all parts of the world, and the benefit derived from the use of such waters is sufficient to attract countless multitudes of visitors year after year; but that these patients are never cured, no matter how much temporary benefit they may derive from the thorough emptying of their intestines and the unloading of accumulated poisons, is shown by the fact that they always return, often being compelled to return at increasingly frequent intervals.

Results of a Reformed Flora

Again, we find in the remarkable effects which have been obtained by various special dietaries an equally good illustration of the curative value of means which influence the intestinal flora. The grape cure, the apple, peach, cherry and other fruit cures, the milk, buttermilk and whey cures—all of these cures operate through their influence upon the intestinal flora. The same statement may also apply to the raw food cure, which has acquired considerable vogue in the last few years.

Fruits and milk are substances which fer-

ment but do not putrefy. Hence, when the diet is exclusively confined to these articles, fermentative changes rather than putrefaction take place in the intestine, acids are formed instead of poisons, and for the time being the body is delivered from the destructive influence of the highly potent toxins produced by putrefactive germs when active either within the body or outside of it. Raw foods of a vegetable character are alive and hence able to resist the action of bacteria. Vegetable foods taken in a raw or uncooked state are digested before it is possible for them to undergo destructive changes, and thus their use discourages the growth of bacteria in the intestine, especially those of the putrefactive sort.

Dangerous Germs Made Harmless

Bienstock showed that the colon germ, which, in the presence of protein (meat, eggs, etc), produces indol and other highly active poisons capable of causing hardening of the arteries, headache, probably Bright's disease, and numerous other disorders, is, in the presence of sugar, incapable of producing these

poisonous substances, producing instead harmless acids.

Sir Lauder Brunton, of England, and more recently Kennan, in this country, have shown that this is true of practically all putrefactive germs; that is, the germs which cause putrefaction when growing on protein will, if supplied with a sufficient amount of sugar, cease to produce putrefaction and poisons and produce fermentation with harmless acids instead. In other words, putrefaction germs may be reformed by simply feeding them with sugar. This explains the fact that eggs, which of all substances most readily undergo putrefaction, may be perfectly preserved by the addition of sugar. It also explains the fact that the pioneer housewife and the nomadic Arab maintain a supply of fresh meat by immersing cutlets in cow's milk or camel's milk. The writer has in his possession a beefsteak which has been kept in a state of perfect preservation for more than six years (since June, 1906), by immersion in buttermilk made from a culture of the *Bacillus Bulgaricus*.

It appears, then, that putrefactive organ-

isms, which are now recognized as among the most common and deadly enemies of human life, may actually become harmless and even useful by supplying them with sugar, provided this can be done at the proper time and in the proper place.

How to Change the Intestinal Flora

After studying this question for more than twenty years, or ever since the appearance of Bouchard's great work, "Autointoxication in Disease, or Self-Poisoning of the Individual," the writer has been fully persuaded that it is possible to change the intestinal flora, and that this change is one of the most practical and important means of combating the great majority of the chronic diseases with which the physician has to deal. A method which has been thoroughly tested is the following:

1. The adoption of a strict antitoxic diet. This requires, for most rapid results, the exclusion of all animal protein; that is, meat, including fish, fowl and game, as well as beef, mutton and pork, together with eggs and milk and all preparations and dishes containing these animal proteins must be strictly

avoided. In extreme cases of autointoxication, the strict exclusion of all animal protein is absolutely necessary. In milder cases milk, especially in the form of buttermilk, may be used. It is important, however, before permitting the use of milk to determine by examination of the feces whether or not the patient is able to digest casein. This must be determined by the application of Tri-boulet's test. When reaction is positive, milk must be discarded. The test shows that casein is not well digested and hence cannot be absorbed in the small intestine, so that when it finds its way into the colon it furnishes food for some of the most active and virulent forms of putrefactive organisms. Cow's milk has been clearly shown to be very poorly adapted to the human digestive apparatus. It acts as a virulent poison in many cases, because, as Tissier has shown, it promotes the growth of organisms which produce highly active toxins.

Antitoxic Foods

The diet should consist of fruits, cereals, and fresh vegetables, and should include a

considerable amount of uncooked vegetables, such as lettuce, cucumbers and cabbage. The experiments at the Pasteur Institute have shown that potatoes and dates are particularly valuable as antitoxic foods, for the reason that the carbohydrates which they contain—starch in the potato, and sugar in the date—are not fully absorbed in the small intestine and reach the colon in larger amount than do the carbohydrates of most other foods. Carrots were found by Metchnikoff's experiments also to be a highly valuable food. Another specially valuable food, of which the writer has made much use with excellent success, is oatmeal prepared by quick cooking. The steel-cut oats or old-fashioned Scotch oats are better for the purpose than rolled oats. Instead of cooking a long time so as to insure the complete conversion of all the starch, the oatmeal should be stirred in boiling water and cooked for five minutes, then set aside for five minutes more, and then served. Oats prepared in this way constitute the brose of the Scotch Highlanders, and is very palatable. Nevertheless, a considerable portion is imperfectly cooked and hence is not

readily acted upon by the saliva and intestinal juices, and thus finds its way into the colon, where it may feed the fermentation germs and by its presence prevent the putrefaction germs from making poisons by the decomposition of protein. This protective action may be increased by the addition of wheat bran to the oatmeal in the proportion of one part to three by volume measure. The bran will hasten the passage of the oatmeal through the intestinal canal and will thus increase the amount of carbohydrate which reaches the colon.

The free use of such saccharine fruits as prunes, figs, and raisins is also a valuable means of introducing carbohydrates in the most available form, since the germs which live in the colon thrive better on a diet of sugar than any other form of carbohydrates. Maltose should be used freely in place of cane sugar as a means of encouraging the growth of the friendly organisms in the intestine.

Increased Intestinal Activity

2. The second step in changing the intestinal flora is to increase the activity of the

intestine. The bowels naturally move three times a day, or at least after each meal. In children, and in many persons who enjoy the best health, the bowels move four times a day—on rising, after breakfast, after dinner, and sometime between supper and bedtime.

Three Movements a Day

The practice of moving the bowels once a day, or even less frequently is peculiar to civilized people and is a result of the sedentary life and other abnormal habits which prevail in civilization. The writer has made very thorough-going inquiry among medical missionaries and others who are acquainted with the habits of primitive peoples, and finds that the universal practice among really primitive tribes is to move the bowels three or four times a day. By inquiry at the London Zoological Gardens we learned that this habit is likewise true of the large apes. The keeper in charge of these animals assured us that the gorilla, chimpanzee and the orang-utan move their bowels regularly four times a day. The smaller monkeys, which were eating almost constantly—visitors being

allowed to feed them freely, which was not permitted with the larger apes—moved their bowels ten or twelve times a day, doubtless the result of the constant stimulation of gastric activity, for food is the natural laxative, contact of food setting up peristaltic activity in the entire alimentary canal. Methods whereby the bowels may be made to move three or four times a day have been fully described elsewhere. In addition, it may be said that this activity may be accomplished in most cases by the use of bulky food, acid fruits, sweet fruits, and if necessary by the use of agar-agar and paraffin oil (colax and para-lax). The cool enema may also be employed if necessary. In many cases special exercises, massage of the colon and other helps are needed, and in exceptional cases surgical measures are required to break up adhesions, remove obstructions, or to overcome other mechanical obstacles, such as kinks, loops, bands, etc.

Protective Acid Forming Bacteria

3. Antitoxic or protective ferments. These consist of fermentation or acid-form-

ing bacteria, which have been shown to be harmless and capable of growing in the intestine and producing conditions unfavorable for the development of putrefaction germs. The best known of these beneficent germs is the *Bacillus Bulgaricus*, discovered by Grigoroff, studied by Tissier of the Pasteur Institute, and popularized by Metchnikoff. Another important protective germ is the *Bacillus bifidus*, discovered by Tissier and successfully used by him in the treatment of thousands of cases. Another important organism, the *Bacillus glycobacter*, recently discovered by Wollman (Distaso of the Royal Institute of Public Health, London, claims to have discovered the same germ a year earlier than Wollman), is highly extolled by Metchnikoff as a helper for the *Bacillus Bulgaricus* and other acid-forming germs by the fact that it is capable of forming sugar from starch in the colon. This germ greatly increases the efficiency of the *Bacillus Bulgaricus* and *Bacillus bifidus*, because it insures them a supply of the food which they require for vigorous development

in the colon. The fact that sugar is almost completely absorbed from the small intestine before the digestive contents reach the colon gives the *Bacillus Bulgaricus* a very poor chance to grow and develop in the colon. By aid of the *Bacillus glycobacter*, however, this difficulty is overcome. By a combination of the *Bacillus Bulgaricus*, the *Bacillus bifidus* and the *Bacillus glycobacter* in a special culture we have found it possible to secure greater and far more rapid results than heretofore in changing the intestinal flora. By the administration of a sufficient quantity of this culture before each meal, or three times a day, the intestinal flora may be rapidly changed. The *Bacillus Bulgaricus* appears in the stool within a few days after the administration of the culture is begun. It is important, of course, that the diet should be thoroughly antitoxic, as above described, and also that the bowels should be made to move three or four times a day, as already indicated. It is by the combination of many factors only that the results desired can be obtained.

Special Colon Injections

4. Of great value in special cases, particularly in cases of spastic constipation due to colitis, is a measure by means of which change of the flora may be greatly expedited by introducing the special culture described in the preceding paragraph, along with milk sugar or malt sugar, into the colon. To accomplish this efficiently the patient is placed in the knee-chest position and by means of a proper instrument, the proctoscope, the culture is passed as high as possible into the pelvic colon. By requiring the patient to retain the knee-chest position for a few minutes, taking deep breaths in the meantime, the culture is carried high up into the colon and by the anti-peristaltic movements of the transverse colon may be even made to reach the cecum. The quantity of the culture employed may when necessary be increased to a sufficient volume to fill the colon. The culture is usually administered at night and is if possible retained over night so as to give opportunity for the growth and development of the acid-forming organisms in the colon.

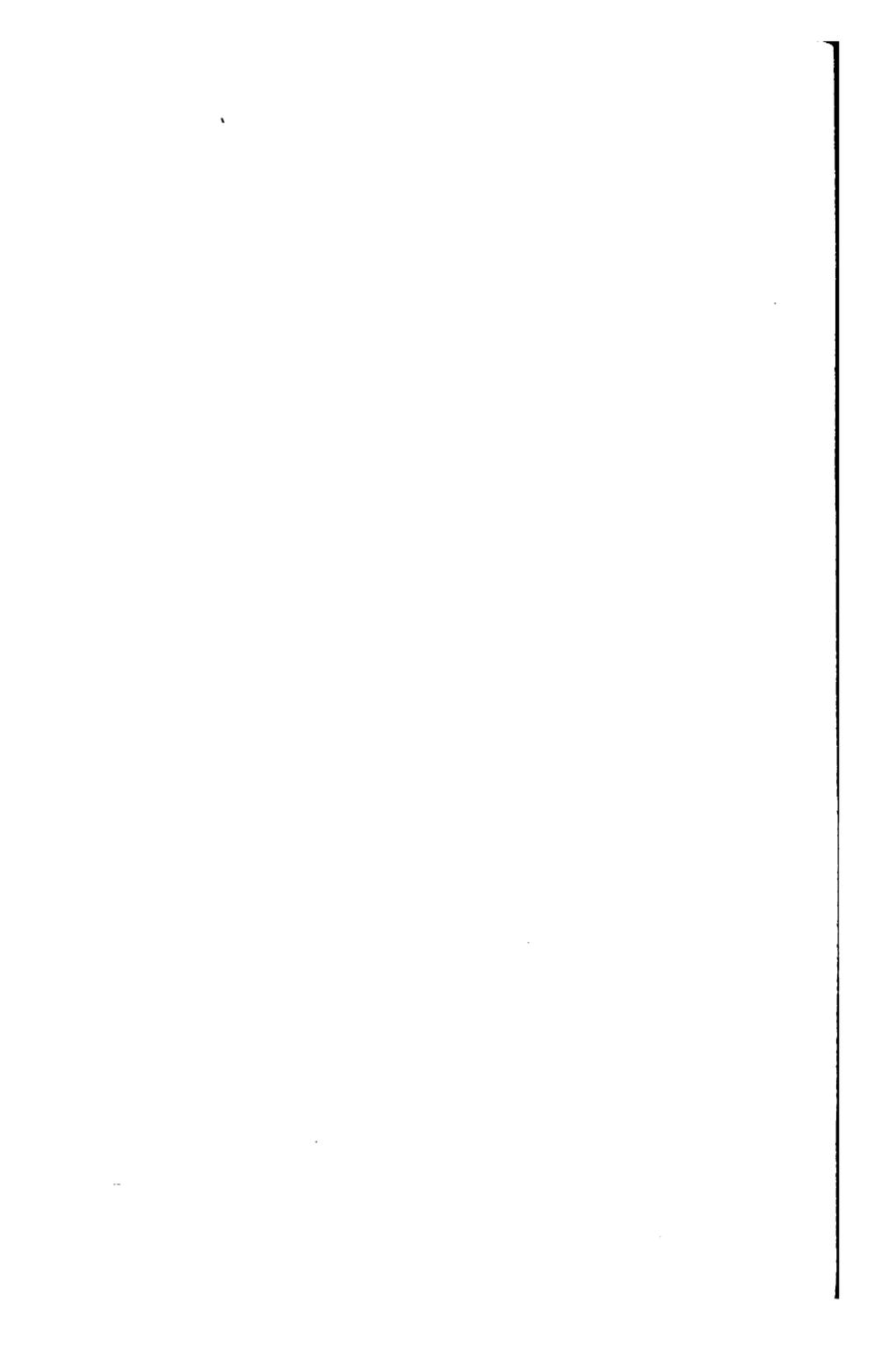
How Headaches May be Made to Disappear

Experience in a large number of cases demonstrates that by the employment of the above described method the intestinal flora may be rapidly changed, and with the change of flora it is gratifying to note the rapid disappearance of a multitude of distressing symptoms which have previously in many cases made the patient's life almost unendurable. Headaches disappear, usually at once, sometimes more gradually, and coming on at longer intervals, and becoming less and less severe, until they disappear entirely. Bilius and asthmatic attacks, backaches, and abdominal pains due to colitis, skin eruptions, fetor of the breath, offensive perspiration, and a host of other symptoms rapidly vanish. The tongue clears, the pigmentation of the skin gradually fades, the hands and feet are no longer cold and pale, mental depression, irritability and insomnia disappear with other morbid conditions, and the patient recognizes that a regeneration process is rapidly going forward. Nothing could be more delightful or gratifying than the transformation which takes place in one who has long suffered from

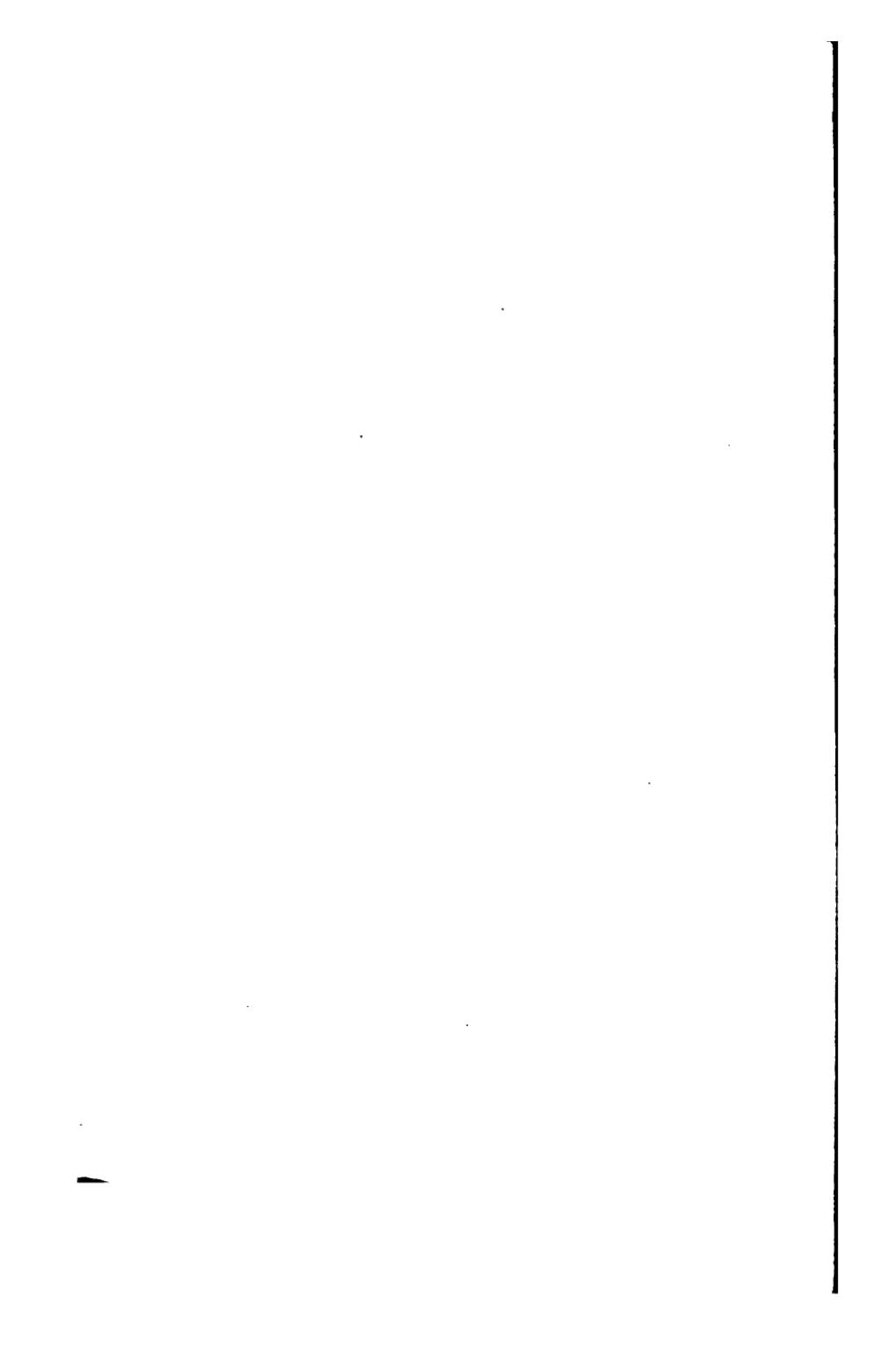
intestinal toxemia when the pernicious flora have been replaced and reformed and normal conditions established.

The Colon Not a Sewer

Nature never intended that the interior of the human intestine should be degraded to the condition of a privy vault or an obstructed sewer, flooding the blood with brain- and nerve-paralyzing and disease-breeding poisons. This is clearly evident, not only by the observations of Levin at Spitzbergen, above referred to, but also by the discovery in South America of a parrot which lives wholly upon bananas, and the fecal discharges of which have the fragrance of bananas and are inoffensive as bananas themselves. What natural reason can be shown that food that enters the body clean, sweet and sterile should leave the body in a state horribly loathsome with corruption?



Dangers in School Life



Dangers in School Life

THAT the human race is degenerating, at least that there is a decided trend toward race deterioration going on among all civilized races, is no longer disputed. The facts which have been brought forward by recent reports of the American and other census bureaus, and by the researches of life insurance companies, leave no room for doubt that the civilized portion of the human race is showing many most decided evidences of race decay.

Decay of the Teeth Symptom of Race Decay

Biologists recognize as a general law that premature decay of the hard structures of the body is one of the most indubitable evidences of racial decay. Among the people of the United States at the present time, it is very rare to find a person thirty years of age or over who possesses in a sound condition all of the thirty-two teeth which belong to him. Dentists are among the most pros-

perous of professional men. Somebody has suggested that the cemeteries of the present may become the gold mines of the distant future. It probably would be impossible to find in the public schools a group of 100 children, or even a much smaller number, all of whom were free from dental decay. Doctor Cornell, of Philadelphia, declares that from one-third to one-half of all school children are in need of dental treatment. In the city of Baltimore, 1170 out of 9295 public school children examined in 1907 showed decayed teeth. The London report for 1907 reveals a most deplorable condition of the teeth as the result of the examination by Doctor Kerr of 700 young pupils in the public schools. One pupil had seventeen decaying stumps in his mouth. Another boy had not a single sound tooth. What valuation would a horse dealer place upon a lot of one hundred colts one-third or one-half of which presented decayed teeth?

Constitutional Feebleness

Decay of the teeth is not merely an accident; it is not alone the result of neglect of

daily cleansing: it is an evidence of constitutional feebleness. The child whose teeth are not able to resist the attacks of the bacteria to which they are necessarily exposed in the mouth has bones which will readily yield to the attack of the tubercle bacillus, and soft tissues which are unusually susceptible to the various parasitic enemies to which the human organism is exposed. Such a child is a weakling and will die prematurely.

Increase in Eye Disorders

The great increase in eye disorders which has been noted in recent times, must be attributed to hereditary defects as well as to the evil conditions imposed by school life. In this we have likewise an evidence of organic decay.

Eye Disorders More Prevalent

Another marked evidence of race decay, affecting especially the central nervous system, is to be noted in the great increase of insanity. Within fifty years the proportion of insane to the whole population has increased 300 per cent. Numerous neurologists have

called attention to the rapid increase of insanity in this as well as in other civilized countries, and especially to the increase of that form of brain degeneration known as paresis, one of the most hopeless of all forms of brain disease. At the present rate of increase, only a few centuries will be required to inoculate the whole population with the virus of mental unsoundness.

Growth of Chronic Disease

The increase of chronic diseases of various sorts, as shown by the last United States census, is such as to be truly alarming. The census of 1900 showed that while the mortality from certain acute maladies such as typhoid fever and other infectious disorders was somewhat decreased, the increase of mortality from leading chronic disorders was such as to render the death rate from these diseases within fifty years five to seventeen times the present death rate. This increase of chronic disease is a certain indication of race degeneration, since it indicates diminished power of resistance to the death dealing conditions with which man's environment

in civilized life bring him in daily contact.

Diminished longevity is another evidence of race deterioration of which the positive proof is now in evidence. The great increase of average longevity in modern times, of which sanitarians have boasted so much, has been due entirely to the wonderful progress which has been made in the control of acute infectious maladies through the discovery of bacteria and the development of bacteriology. In Chicago, for example, improved sanitary conditions in the course of a few years added nearly nineteen years to the average length of life of Chicago citizens. The results of sanitary improvements in New York city were even better. This great increase in life duration due to the suppression of typhoid fever and other acute disorders has served to cover up the marked increase in mortality from chronic disorders, which has been going on simultaneously, and which manifests itself in the decrease in the proportion of centenarians or very aged persons. This decrease in centenarians has been very manifest in Germany and in England for a long time. The demonstration that the same is true

in this country has recently been made by life insurance companies, whose researches show that in the last two decades there has been a marked decrease in the expectancy of life after sixty years.

With these facts before us, it is manifestly the duty of those who are studying questions of general interest to the physical welfare of the race to seek earnestly to discover and so far as possible to remove the causes which underlie this terrible movement toward race extinction which has become so decidedly manifest in recent times. That some of these may be found in the school room is evinced by the considerable effort which has been made in recent years to better the conditions of school life.

A Broadened Conception of Teaching

In the first place, the average school teacher needs to become possessed of a new conception of the purpose of the school and teaching. At the present time, it seems to be the purpose of the primary school to prepare the student for the grammar school, and of the grammar school to enable the pupil to

get into the

enter the high school, and of the high school to prepare the student for the university, and of the university to prepare the student to enter the aristocracy of the university alumni. The standards by which the student is tested at the various steps of his progress are purely artificial modes of measuring his fitness for advancement. They have little resemblance to the natural tests to which he will be subjected when he actually enters upon the duties and responsibilities of life. Indeed, they have little if any relation to what he is going to do or what he is going to be unless it may happen that his purpose is to devote his life to teaching and thus enter upon the work of passing on to others the artificial training and culture which he has himself received.

High School Methods Need Reforming

Thousands of practical men and women fully recognize the fact that the boy or girl who has spent four years in study in the high school is very little better prepared to enter upon the life duties of the average man or woman than at the beginning of the course.

In fact, large numbers are rendered actually less fit after graduation for the work which they are to do in the world than when they entered the course. The general tendency of the course is to weaken initiative, to impair originality, to lessen both the aptitude and the disposition to engage in manual pursuits which the majority of men and women must follow for a livelihood.

Neglect in Hygiene and Physiology

The weakest point of all is the neglect to instruct pupils in those things which are of most vital consequence to each one individually, to the nation, and to the race. The instruction in physiology and hygiene is of the most elementary and inefficient character. It is important for the child to acquire a good command of his mother tongue. He must learn how to express himself well in both written and spoken language; but it is far more important that the pupil should learn how to make the most of his constructive faculties through the use of his hands guided by good judgment, practice, thought and

sense, backed up by a patient, industrious disposition. It is especially important that he should know how to preserve his health and how to avoid disease. It is perfectly proper to go further and say that every intelligent person should know enough of the care of the body and of disease to be able in an emergency to apply sensible and appropriate measures, at least temporarily until professional services may be secured.

Culture is Not All

It would certainly seem reasonable to demand that every person who lays claim to liberal culture or who holds a university degree in any department of learning should possess as an essential element of knowledge, without which no person could lay claim to being learned, a fair knowledge of anatomy, a thorough knowledge of physiology, and a very thorough knowledge of public and individual hygiene, and above all, of eugenics. No woman should be allowed to graduate from either high school or university without having received careful instruction in the responsibilities of marriage and in the care of

children, subjects which are altogether ignored in the training of the schools and for which so inadequate provision is made that the majority of women are compelled to enter upon the duties of motherhood with almost no practical instruction whatever respecting the proper discharge of the duties which they have assumed.

When the student leaves the high school or the university, he must as a rule, enter at once upon some occupation for obtaining a livelihood, and how often this occupation is one for which his long years of preparation have done little or nothing to increase his fitness! Some years ago I met a young man, a college graduate, who had spent many years in obtaining a classical education and who possessed a superior knowledge of Greek and Latin. On inquiring as to his occupation I learned that he was a painter. "Portrait painter?" I asked. "Oh, no," he replied, "only a common house painter." "How long a time were you in learning house painting?" I inquired. "I served an apprenticeship of three weeks," was the reply. Sixteen years spent in school

training, then three weeks spent in preparation for actual work! And the most vital thing of all had been neglected both during school life and after. Having learned nothing about the care of his body, he was so broken down in health that he could make no use either of his college training or of his course in post-graduate industrial training.

School Cripples

Our schools are turning out every year multitudes of young men and women who may be properly designated as school cripples. The many years of school life develop a sedentary habit which multitudes never recover from. In many cases this amounts to an actual dread of muscular effort, so that the physical feebleness acquired during the years of muscular inactivity in school are multiplied and intensified. The period of life spent in school is the only period at which any marked influence can be exercised upon the development of the physique. At this time, by proper exercises, it is possible to increase the size of the chest and the lungs, to add to the

stature, to build up the muscular system, to correct various bodily weaknesses and deficiencies, and to acquire a capital of physical energy which may be of immense advantage during a whole life time as a foundation for both physical and mental endurance and efficiency. Great progress has been made in recent years in providing gymnasia and other facilities for physical training, but many years will elapse before every public school will be provided with a well equipped gymnasium. It is not necessary to wait for this. Every school room, every school yard, and the great out-of-doors everywhere afford ample opportunity for all that is essential in the direction of physical training and muscular development. To simply turn the students outdoors to play or to turn them loose in a gymnasium is by no means sufficient. The students of every school should be carefully studied and classified as regards their strength and physical ability. Their physical work should be supervised with as much care as their work in language or in any other branch. The teachers ought to join with them in their exercises, whether at work or gymnastic

games, and will thereby be profited as much as their pupils.

Physical Culture Needed

Provision should be made in connection with every school for instruction and practice in swimming, both summer and winter; and properly equipped outdoor gymnasiums should also be provided for both sexes in which a considerable part of the body's surface may be exposed to the air and the sun. Man is naturally an outdoor animal and requires the advantages to be derived from contact of the fresh air and the sunshine with the skin surface as much as does the gorilla, the chimpanzee and other animals akin to man in their physical structure. Facilities of this sort may be provided at moderate cost, and the expense should not be at all burdensome, even in country districts, especially if the present movement for the consolidation of country schools proves successful.

Helps to Combat Degeneracy

The wearing of clothes is as unnatural to human beings as dwelling in houses, and the

evils growing out of house-dwelling, and smothering the skin with artificial coverings must be antidoted by such means as are afforded by the swimming pool and the outdoor gymnasium. I know of no single measure by which so much good can be accomplished as by these. Swimming in water at a proper temperature (75 to 78 degrees) is the most beneficial of all developmental exercises. The position of the body is such as to give the lungs the greatest freedom of movement, and all the muscles of the trunk and limbs are brought into active exercise under most favorable conditions. The temperature of the water both stimulates and facilitates muscular movement and cardiac activity. There is no other form of physical exercise from which so much benefit may be derived in so short a time. A half hour in the swimming pool two or three times a week, and an hour with the skin largely uncovered in an outdoor gymnasium every other day during the warm months, will work wonders in building up a good physique and developing those functions of the body which pre-

pare it to offer the highest resistance to disease.

Evils Resulting From Adenoids

A recent investigation made in Leipsic by school physicians showed that among 9000 school children, nearly one-fourth were suffering from adenoids, a disease of the post-nasal region which results from low vital resistance and which when neglected results in grave physical deformities of the face and chest, impairment of hearing, and even mental depreciation. It is safe to say that 75 per cent of cases of this sort would disappear if the outdoor gymnasium and the swimming pool could be made to do their part in the physical education of the child.

Another matter of exceeding importance which, though frequently mentioned, has certainly not been emphasized as it should be, is that of correct position in sitting, standing and exercising. School seats are rarely constructed properly. The back of the seats should be of such shape that when sitting erect in a seat the back of the trunk shall be properly supported. This necessitates a

strong anterior curve near the lower part of the back, while the upper part is sufficiently inclined to carry the head considerably back of a vertical line passing through the pelvis. The seat should be well inclined backward so as to prevent slipping down, and the height of the seat should be such that the student's feet can rest upon the floor. Such a seat will place the student in such a position when he sits erect that the chest will be held well forward, the abdominal muscles will be made tense, and thus the abdominal organs will be held in their proper places.

Frequent Exercise Important

Students require short periods of exercise at frequent intervals during the day. Two or three minutes of active exercise after each period will cause no loss in the amount of work accomplished, even if subtracted from the period of study or recitation, as it will unquestionably materially increase mental activity and efficiency.

Physical Equality With Mental Development Essential

The many years spent in the school room render the school life a dominant factor in

the whole life of the child, and it certainly seems reasonable that during this period as much attention should be given to the building up of a healthy body as to the development of the mind. Every year a considerable number of half developed boys, pale of face and lank of limb, are gathered into the great naval school at Annapolis. Here for one whole year almost the entire time is devoted to correcting the deficiencies and deformities which have been acquired through previous neglect. At the end of this period even their intimate friends often find some difficulty in recognizing in the splendid, rosy cheeked, robust, big chested young fellows the weaklings who a year before entered the school.

Of course, every public school cannot be a naval academy, but why should not the public school, the college and the university take the same interest in the physical development of the boy or girl who spends the formative period of life under its roof, take as much interest in the making of the boy or the girl a strong, vigorous, healthy, sturdy young man or woman fit for the battles of

life, as does the naval academy in the training of men for warfare?

New Values Must be Established

The educational concept needs to be enlarged. A new standard of values needs to be established in relation to the content of the curriculum. If the high school graduate knows a little less of Cæsar's wars or bridge building exploits, but knows how to keep his body in fit condition for maximum activity and efficiency, how to eat, how to maintain the normal rhythm of metabolism, the proper rate of intake and outgo in his nutritive functions, he will be vastly better off than though he could repeat the *Æneid* by heart but had failed to acquire the fine art of chewing his food or the habit of eschewing indigestibles and poisons.

The Trend Cityward

One of the serious evils of school life as at present conducted is the result of the prolonged withdrawal of the student from the practical activities of life, especially from muscular work. The sedentary habit is

formed, the boy loses his aptitude for physical exertion, acquires an aversion for muscular pursuits, especially for work upon the soil, the healthiest and most natural of all occupations. A clerkship, a menial position of almost any sort not involving hard work, is after graduation sought for rather than the really splendid opportunities offered by the more rugged and strenuous life upon the soil.

Return to the Soil

The remedy proposed is to bring every child into actual contact with the real and natural life of the land, from which our modern civilization has so far divorced us, and by this means to antagonize to as great an extent as possible both the mental and the physical perversions which are the natural results of city life and which are doubtless the chief factors in modern race deterioration.

Manual Labor a Part of the Curriculum

Connected with every school there should be a piece of land on which every child, large and small, boy and girl, should work.

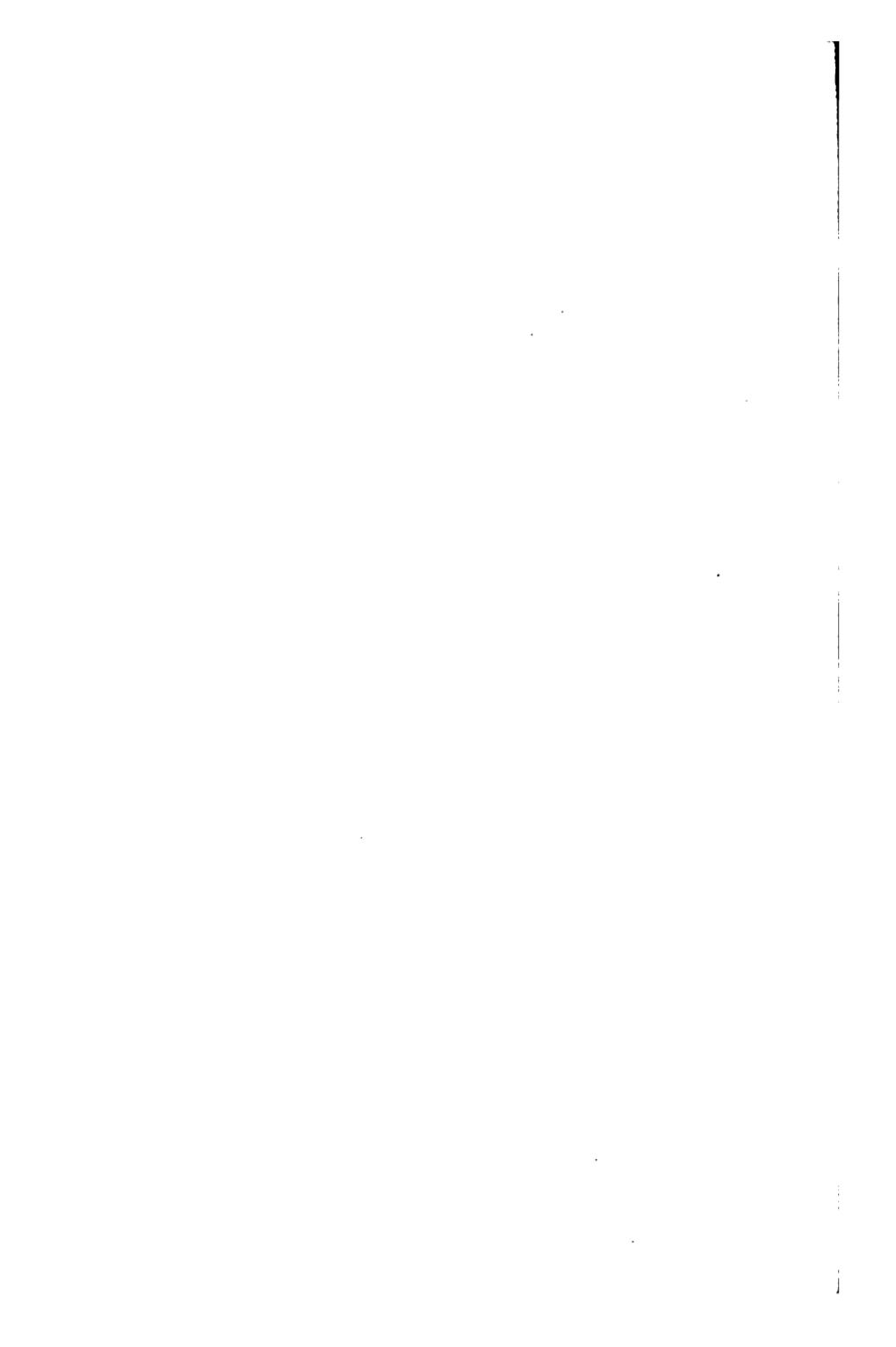
Teachers should accompany the students in their work, improving the opportunity afforded to give concrete instruction in the fundamental facts pertaining to the great natural world, knowledge of which can never be gained from books.

The work should be graded progressively and continued from the lowest classes of the primary school to the senior classes of the high school and even of the university.

The Tendency to Specialism

Our present system of education makes specialists. As a result, we see whole communities consisting exclusively of experts. The all-round man is getting to be a rare exception. This may be temporarily advantageous to our modern industrial machine, but it is certainly a great disadvantage to the individual man, and it is evident that if we cripple, stunt and deform the individual, we shall in the end damage the whole.

The Simple Life in a Nutshell



The Simple Life in a Nutshell

The "simple life," or so-called "return-to-nature," is not an innovation. It is a return to the "old paths" from which the perversions of our modern civilization have gradually diverted millions of men and women, perversions that are responsible for the many maladies and degeneracies which yearly multiply in number and gravity.

Intestinal Origin of Disease

Modern medical research has demonstrated that most diseases from which human beings suffer, chronic as well as acute, are due to infection of the alimentary canal by poison-forming germs. Many scores of such germs are known. The poisons are absorbed, and give rise to a great variety of distressing maladies and symptoms. Unnatural foods and unwholesome habits of life encourage infection of the intestine by introducing poison-forming bacteria and promoting their growth. Natural food and natural habits of life combat these disease-producing infec-

tions. Hence the "simple life" is an anti-toxic life.

General Rules

Give attention daily to cultivating health. It will pay. Study the conditions and the surroundings of the home and the business, and give careful thought to personal habits and practices with special reference to their bearing on health.

Recognizing that health of mind and body is one of the most valuable of all personal assets, make every reasonable effort to maintain intact, and if possible, increase, the capital of physical and mental strength.

Give to the body and its functions that care and study which you would accord to any other valuable and costly mechanism, so as to become familiar with its needs and the best means of supplying them.

Eating for Health and Efficiency

Eat only natural foods; that is, those which are naturally adapted to the human constitution. The natural dietary includes fruits, nuts, cooked grains, legumes, and veg-

etables. Natural food imparts to the body the greatest amount of energy, and maintains normal conditions of life.

Avoid meats of all sorts (flesh, fowl, fish, including "sea food"). These are unnatural foods. They are all likely to contain deadly parasites of various kinds, and always contain noxious germs, meat bacteria or "anaerobes," which infect the intestines, cause putrefaction and other poison-forming processes, and inoculate the body with disease. These germs are not destroyed by ordinary cooking, such as stewing, broiling, frying, and roasting.

Avoiding Excessive Protein

Take care to avoid an excess of protein; that is, the albuminous element which is represented by lean meat, the white of eggs, and the curd of milk. An excess of protein promotes putrefaction, and thus intestinal auto-intoxication, the chief cause of "biliaryness," colitis, appendicitis, gall-stones, arteriosclerosis, possibly cancer, Bright's disease, and premature old age. Ordinary bread contains a sufficient amount of protein, as do also

rice and other cereals and the potato. Most nuts, also peas and beans, contain an excess of protein, and should be eaten sparingly.

Eggs should be eaten in great moderation, if at all. They encourage autointoxication, and thus often cause "biliaryness." The yolk of the egg, it should be remembered, is more wholesome than the white.

Cow's Milk Not Good Human Food

Cow's milk is not altogether suited for human food. A large proportion of invalids—nearly half, perhaps—suffer from "casein dyspepsia," and can not take milk without suffering from constipation, headache, "biliaryness," coated tongue, or other unpleasant symptoms that indicate intestinal autointoxication. Such persons may sometimes make use of fresh buttermilk, sour milk, cottage cheese or kumyss, with less difficulty, and even with benefit. Excellent substitutes for milk may be prepared from nuts.

Animal fats, such as lard, suet, and ordinary butter, should be avoided. They are difficult of digestion, and promote intestinal autointoxication, and thus cause "biliary-

ness." Vegetable fats are more easily digestible, and do not encourage intestinal auto-intoxication. To be wholesome, butter must be perfectly sweet, and should be made from sterilized, or boiled, cream.

Dangers of Tea and Coffee

Avoid poison-containing foods. Tea, coffee, chocolate and cocoa contain poisonous alkaloids which impair digestion, damage the nerves, and promote disease of the liver, kidneys, and blood-vessels. Cereal beverages and hot fruit juices are wholesome substitutes for tea and coffee.

Irritating Effects of Condiments

Condiments — mustard, pepper, pepper sauce, cayenne, capsicum, vinegar, hot, irritating sauces, and spices of all kinds—must be wholly discarded. They irritate the stomach, thus giving rise to gastric and intestinal catarrh, and damage the liver and kidneys.

Common salt, or chlorid of sodium, should be used sparingly, if at all. According to Richet and others, the food naturally contains

all the chlorid of sodium actually required by the body, so that the addition of salt to the food is necessary only to please an artificial taste. A safe rule is, The less the better.

How to Secure Proper Combinations

Food combinations should be such as to give the proper proportion of the several elements,—proteins, carbohydrates, and fats. Fruits and vegetables, as well as other combinations of natural foodstuffs, agree perfectly when mastication is sufficiently thorough to reduce the food to a liquid state in the mouth and when indigestible residues are rejected.

The quantity of food should be adapted to the size of the person and the amount of work which he does. Never eat to satiety. A person of average height and moderately active requires 200 calories of protein, 450 calories of fat, and 1,350 calories of carbohydrates, or a total of 2,000 calories, or food units, daily. The total number of calories required is furnished by the following: Bread, $10\frac{1}{2}$ oz.; milk, 6 oz.; potatoes, 8 oz.; butter, $2\frac{1}{4}$ oz.; corn flakes, $1\frac{1}{4}$ oz.;

cream, $2\frac{1}{4}$ oz.; apples, 7 oz. Be careful to eat enough. The body can dispose of a small excess, but is not able to make up a deficiency.

Appetite Juice

Food must be well relished to be well digested. According to Pawlow, "appetite juice," which is produced by stimulation of the nerves of taste by palatable food, is the most important factor in gastric digestion. Eat only when hungry, never because it is meal-time, or because invited to eat.

Cane-Sugar Eaten in Small Quantities

Cane-sugar should be eaten only in small quantity. Large quantities give rise to gastric catarrh and indigestion. Sweet fruits, such as raisins and figs, and honey, are natural and wholesome sweets.

A sedentary life tends to produce intestinal inactivity; that is, slow digestion and constipation; hence, the ordinary daily bill of fare should supply an adequate amount of laxative foodstuffs, such as sweets (not cane-sugar or syrups) and sweet fruits, especially figs and prunes, acid fruits and fruit juices,

fats, fresh vegetables, and whole grain preparations.

Some fresh, raw food should be eaten daily in the form of fresh fruits or fruit juices, nuts, or salads. Raw cereals, roots and tubers, are indigestible. The cellulose of fruits and of young buds, leaves, and shoots is digestible in the intestine.

Fresh vegetables and whole grain cereals are needed to supply alkaline and earthy salts. The blood and all living cells require these salts, as do the teeth and the bones. The free use of cane-sugar and meats leads to lime starvation, because of the deficiency in lime.

Eating at Regular Hours

Eat at regular hours, so as to maintain the normal intestinal rhythm which secures the daily movement of the bowels. Rather than omit a meal entirely, eat some fruit, or drink a glass of fruit juice, buttermilk, or some other simple nutrient which will keep up the peristaltic procession and rhythm. Never take food into the stomach when remains of a previous meal are present.

The best meal plan is to eat twice a day.

Eight to nine A. M. and three to four P. M. are the best hours; or eleven A. M. and six P. M., if the retiring hour is necessarily very late.

If three meals are eaten, the heartiest meal should be taken at midday. The breakfast should be substantial, the evening meal very light, especially avoiding pastries, fats, rich sauces, and hearty foods. The evening meal should consist chiefly of ripe or cooked fruits, liquid foods, and such cereals as boiled rice or cereal flakes.

Avoid iced foods and drinks. Very cold foods or drinks, if taken at all, should be swallowed slowly and in very small quantities.

Don't Worry

Dismiss work, worries, business cares and annoyances while eating. Good cheer promotes good digestion.

What we eat today will be walking about and talking tomorrow; hence all foods not known to be pure and wholesome should be avoided. Especially avoid rich and so-called hearty (hard to digest) foods, and such indigestibles as pickles, green olives, and preserves.

Take three pints of water a day, including liquid food.

Do not drink much at nor immediately after meals. Take a few sips whenever thirsty.

Drink a glassful of water on rising in the morning, on retiring at night, an hour before each meal, and two or three hours after eating.

Live as much as possible in the open air. If compelled to work indoors, be sure that the living and work rooms have an ample, continual supply of fresh air. The lower the temperature the better, so long as the body is kept comfortably warm. Temperatures above 70° are depressing. The breathing of cold air is a continuous tonic; every breath is a tonic bath, a vital lift. A thousand breaths an hour count greatly toward health or disease, according as the air breathed is pure and cool, or impure and hot.

Outdoor Exercise, Especially Gardening, Important

Working in the open air is one of the best forms of exercise, especially working in the

garden, digging, hoeing, pruning, etc. Do some good, hard muscular work every day, enough to produce slight muscular fatigue; but avoid exhaustion. Exercise out of doors an hour or two daily.

Swimming in water at 76° to 80° is the best of all special health exercises. Rapid walking and hill-climbing are excellent.

One need not degenerate physically because his occupation is sedentary. Always sit erect, with chest held high and the small of the back supported. Sit as little as possible. Standing and lying are more natural and healthful positions than sitting. One may exercise while sitting at work by stiffening the muscles of first one limb a few seconds, then the other. All the muscles in the body may be exercised in the same way.

Deep breathing aids digestion, encourages liver and bowel action, develops the lungs, and purifies the blood. The only directions needed are to hold the chest high and breathe as deep as you can ten or twenty times every hour, or oftener. The best "breath" gymnastics are swimming, hill climbing, and rapid

walking or running. Always breathe through the nose.

How to Work

In walking, always hold the chest high and carry it well to the front. Swing the arms moderately, and walk fast enough to hasten the breathing a little. Nine miles a day at the rate of three miles an hour is the proper distance for the average adult. Most housekeepers and laborers do more.

Develop the abdominal muscles by some simple exercises, such as walking on tiptoe with chest held high, or running round the room on all fours; or lie on the back, hold the legs straight and raise them to the perpendicular, repeating thirty or forty times three times a day.

Lying on the back, raise the body from the lying to the sitting position with the hands placed upon the back of the neck. Repeat ten to twenty times three times a day, gradually increasing the number.

If the abdominal muscles are weakened, so that the lower abdomen bulges forward, a tight flannel bandage, or more substantial

support, should be worn about the lower abdomen when on the feet, until the muscles have been strengthened by exercise.

Cleanse the mouth and teeth thoroughly before and after each meal, on rising and on retiring. A foul tongue and decaying teeth indicate mouth infection and probable intestinal autointoxication.

When to Bathe

Twice a week in winter, take a warm cleansing bath before retiring. Apply olive oil or fine vaseline after the bath if the skin is dry. Bathe daily at night in warm weather.

Take a short cold bath every morning on rising. This is an excellent tonic. Or take a cool air bath morning and night, rubbing the skin with a dry towel.

A very short hot spray or shower bath (half a minute at 110°) may, if necessary, be substituted for the cold bath.

The hands, nose, and scalp also require sanitary attention. For the hands, use a good soap and rinse well with soft water.

The bowels should move thoroughly at least once a day, most naturally soon after

breakfast. Two daily movements are better, soon after each of the principal meals. Putrid, foul-smelling stools are an indication of intestinal autointoxication, and are due to an excess of protein in the form of meat, eggs, or possibly milk. Such a condition always breeds disease.

Get Plenty of Sleep

Sleep eight hours each night. If not strong, or if neurasthenic, take a nap before dinner. Growth, assimilation, and repair are most active during sleep.

Surroundings at night should be quiet. Sleep amid noise is not normally refreshing.

On the right side, slightly turned toward the face, is the best position during sleep.

The bed should be neither too hard nor too soft. Avoid feathers. The covers should be dry, warm, and porous. Avoid overheating by excess of clothing. Use a small pillow, or none at all.

Always breathe outdoor air when asleep, supplied by means of wide open windows, a window tent, an air tube, or a sleeping bal-

cony. Do not sleep within two hours after eating.

Make the weekly Sabbath a day of complete rest from work. Take a half-day off in the middle of the week, if possible.

The clothing should be loose, comfortable, light and porous. Restrictive clothing is necessarily damaging, for the trunk of the body is continually changing in form and size. Wear porous, cotton or linen underclothing next the skin.

Avoid waterproofs except for temporary protection. Clothe the extremities so as to keep them warm and dry. Avoid too much clothing.

Alcoholic Liquors and Tobacco

Discard tobacco, alcoholic beverages, and other nerve foolers. They are poisons which lessen efficiency and shorten life.

Avoid nostrums and patent medicines. The habitual use of any drug is harmful.

For inactive bowels, knead the abdomen well with the hands night and morning. Eat laxative foods, especially fruits and nuts, and whole-grain "cereals." Avoid oatmeal mush.

Drink a glass of cold water or eat an orange on rising and retiring. Exercise the abdominal muscles.

If sleepless or nervous, take a warm bath at 102° F. for one or two minutes, then cool to 93° to 95°; continue half an hour to two hours if necessary.

What to Do for "Biliousness"

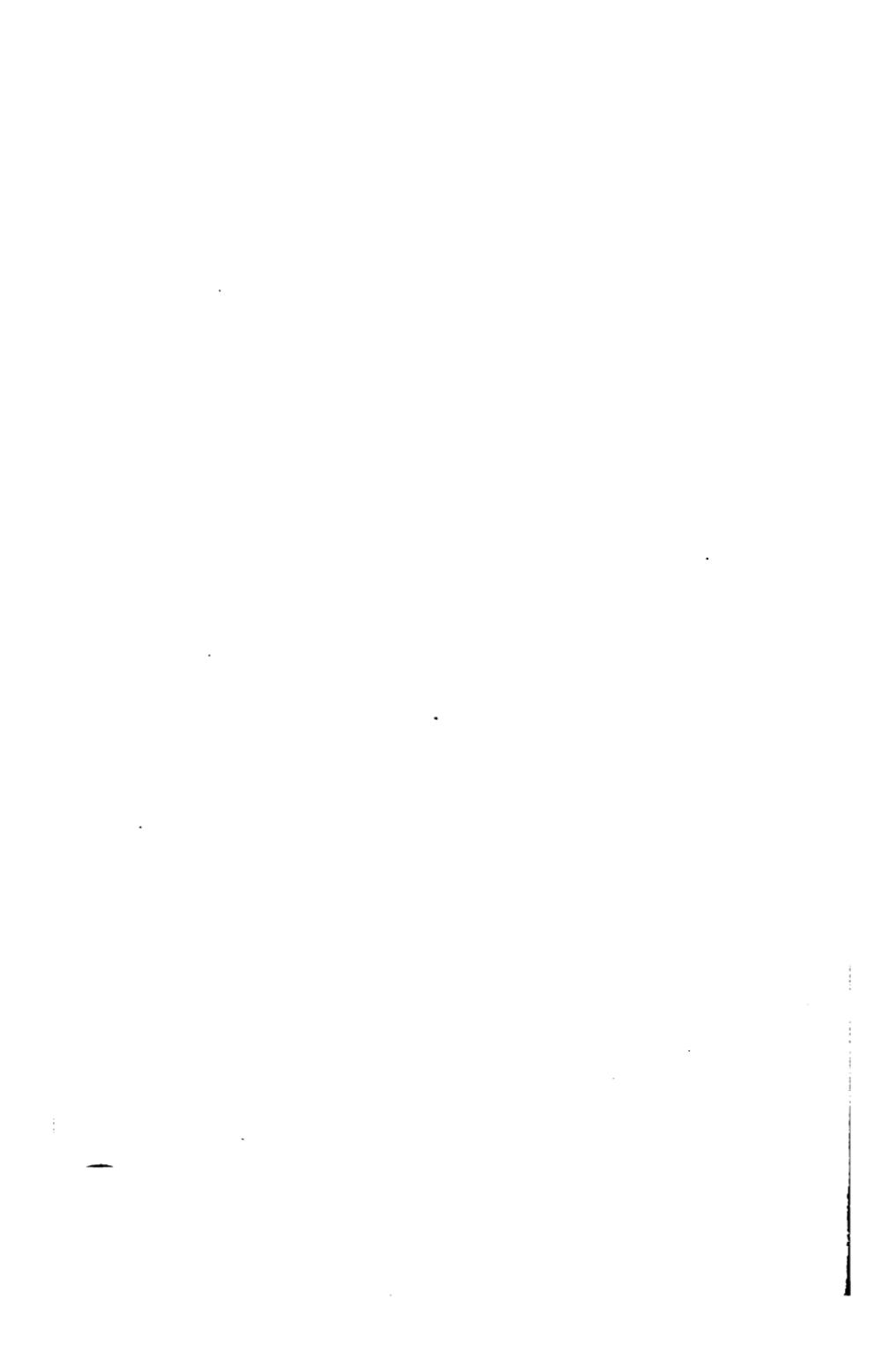
For "biliousness," clear the stomach and bowels, fast or eat fruit exclusively for a day or two, and adopt a strict antitoxic diet, avoiding meat, eggs, animal fats, and perhaps milk.

Almost all cases of acute illness, excepting contagious disorders, are due to some form of auto intoxication. The best remedy is fasting, or a meager diet of fruits and cereals, for a day or two.

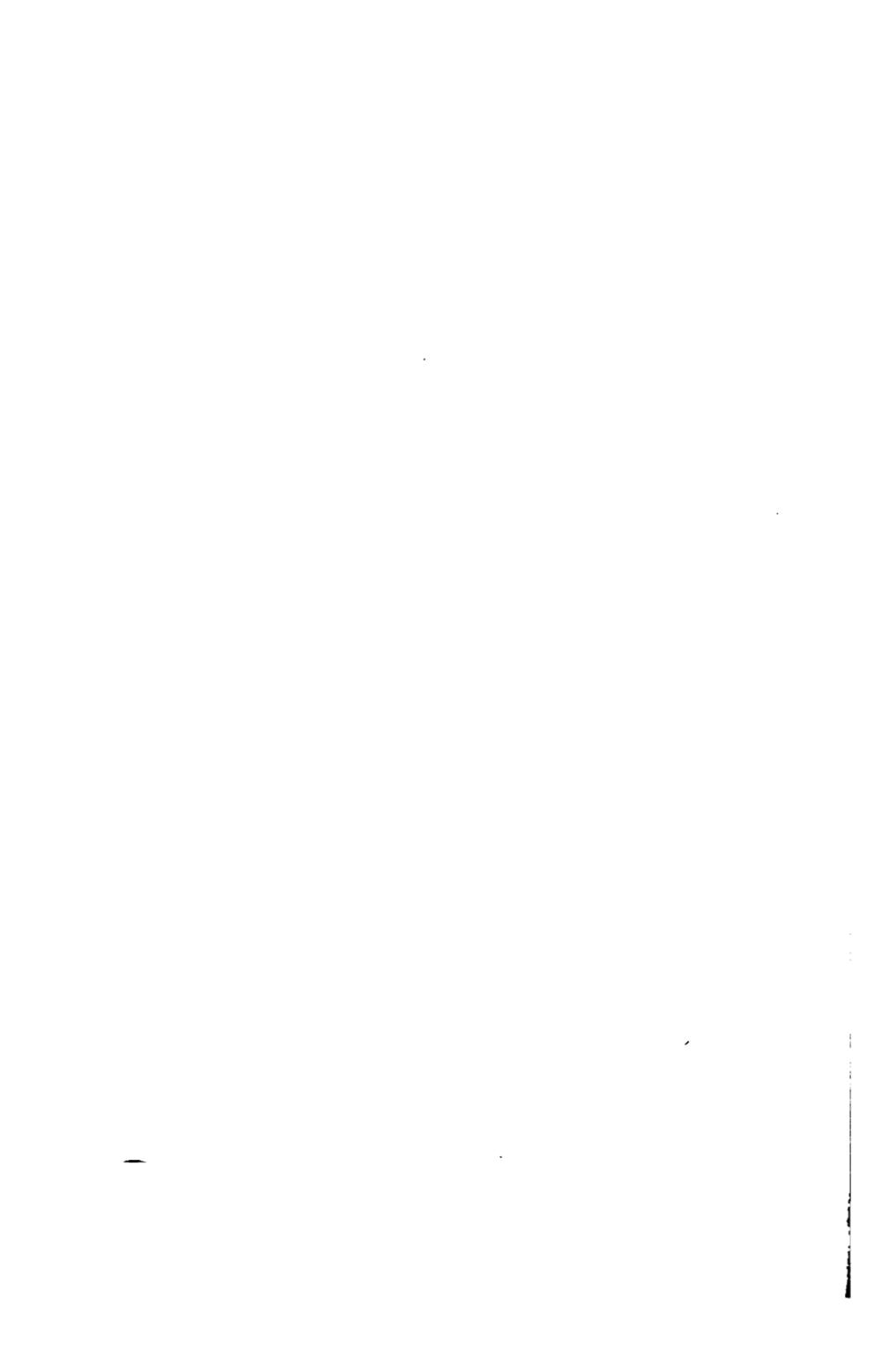
The best foods in the order of excellence are: fresh, ripe fruits, cooked fresh fruits, cooked dried fruits, nuts, water bread, rice, zwieback, toasted corn flakes, potato, cauliflower and other fresh vegetables (if fiber is rejected), honey, buttermilk, sterilized milk

and cream, peas, beans, lentils, raised bread, sterilized butter.

Eat, drink, sleep, exercise,—do all for efficiency. Said Paul, "Whether ye eat or drink, whatsoever ye do, do all for the glory of God." A man can do credit to his Creator only in following the natural order of life intended for him.



**Tobacco—Arch Enemy of
Efficiency**



Tobacco—Arch Enemy of Efficiency

It is one of the enigmas of modern life that the average business man, the man who demands the highest degree of efficiency in every department of his business, be it factory or store or office, should continue to use tobacco, knowing that it is one of the deadliest of poisons and one of the worst of all enemies of mental power. It is astonishing that his business sense, his genius for economy, should permit him to consume so much of his energy in a perfectly useless and harmful way. Do you know, the man who smokes consumes far more energy in puffing away at his cigars than he devotes to his business; it takes more energy to run a cigar than to manage the biggest business in the country.

Lincoln's Opinion of Tobacco

Observe, I do not say it requires more brains—quite the contrary. Abraham Lincoln, you may remember, said one time that

if he had a son who smoked cigarettes and parted his hair in the middle he would maul him to death with a squash. Lincoln in this as well as in other respects set a fine example for his country. He neither drank nor smoked—and I hope we shall have other presidents who will not smoke.

And this matter of example, let me say, is a vitally important one. When I was studying in New York City forty years ago I heard one day a splendid anti-tobacco lecture delivered by a member of the faculty. After the lecture I notice that the professor as he stepped out the rear door lit a cigar. The act did not influence myself, for even then I was opposed to the use of the weed, but the effect upon the other students was to nullify everything he had said in his lecture against the horrible consequences of using tobacco.

Easing the Load of the Liver

Any man, indeed, who stops to study himself, who inquires into the means by which he can conserve his vital energy and increase his efficiency, discovers that the first thing to

do is to raise the load off his liver, kidneys, and other organs; he discovers, for instance, that the work his lungs and kidneys are required to do in eliminating nicotine is far more than all the work involved in digesting food and performing intellectual labor, and if he is a wise man he will drop immediately the use of tobacco. He discovers, too, that meat and alcohol and tea and coffee contain and give rise to poisons that cripple the organs of elimination, and he discards them along with the tobacco. And presently he will find himself in possession of energy that he never dreamed himself capable of. His experience will be similar to that of a lady who was troubled with chronic headaches and who had a desire to have her eyes treated and fitted with spectacles. We found on examination that she could not see things straight; every object on which she gazed appeared to her crooked, like a rail fence; a picture frame looked, the edge of it, like a fine, wavy line. We fitted her with proper glasses, and on looking at her husband she exclaimed, "Why doctor, I did not know my husband was so handsome a man." So with

the tobacco user—convince him that he is being injured and handicapped by nicotine; get him to give up smoking and chewing until his blood is thoroughly cleansed and his tissues purified and his natural strength brought back, and he will not know himself; he will be surprised at the strength which lies latent in him. And if he is a man of character he will never return to the weed again.

Tobacco an Age Producer

I remember some twenty-five years ago a man whom I lectured on every possible occasion. One day he came into my office, putting out a cigar as he entered the door. As he sat down I said, "Come, my friend, you are seventy years old and very thin." "Yes," he replied, slowly, "I am very thin. I wish I could put on a little more flesh." "You walk rather feebly, too," I observed, "and I suppose you do not feel too strong." "No," he said, "I am nearly seventy now, and pretty near the end of my rope. I cannot expect to live long." "Suppose," I replied, "suppose you celebrate your seventieth birthday by throwing away your cigars; by giving

up tobacco and observing results." "Oh," he said, "it is too late; I am too old." He went away and I did not see him for six months or more. One day he came into my office, stepping spryly and with a distinct addition of weight. "Doctor," he said, as he shook my hand, "I took your advice and threw my tobacco away on my seventieth birthday, and I have gained fifteen pounds and feel—why, I feel twenty years younger." And he lived and enjoyed the best of health for another ten years.

Paralyzing the Mental Processes

Some years ago I met the chief justice of one of our northern States—a delightful gentleman, with a charming personality. He smoked very heavily—twenty strong cigars a day, in fact. I said to him one day, "Judge why do you smoke? Can you make a better argument when you smoke, or give a clearer opinion? Does tobacco stimulate the brain and render your mind more active?" "Why no," he replied; "I found out years ago that if I wanted to make a good strong argument before a jury I must not smoke. I found

out that when I had smoked I felt while delivering the argument that it was wonderful, a masterpiece in every way; but afterwards I found that in reality it was extremely weak. So I long ago learned that I must not smoke before making a plea before a jury." Later on he gave up the habit.

A runner who sets out to win a foot race never thinks of preparing for the contest by smoking; he knows that he might as well concede defeat before he starts; the effort to run would be wholly useless. Boxers have learned the same lesson—you could not induce a man in training for a pugilistic event to smoke a cigar. And yet business men, lawyers, professors—most men who set out in the race of life, determined to achieve success in their particular field of endeavor, hang onto their cigar as though it were an aid to achievement, instead of being the terrible handicap that it is.

The Case of Ex-Senator Depew

As an example of what I have been saying I might cite the case of Ex-senator Chauncey Depew, the erstwhile gourmet and *bon vi-*

vant. For many years a member of the Montauk Club of Brooklyn, and always present at Club banquets, he had not been present at the Club for a long time, not even on the occasion of the annual birthday dinner that is given in his honor. One of these latter, the first after long years, he attended not long since, and in explaining his seeming remissness he said, "I had rheumatism so badly I could not be about without difficulty. One day," he went on to remark, "I was at a dinner in honor of the one hundredth anniversary of the birth of Professor Cheuvril, the great French chemist. I said to Professor Cheuvril during the course of the dinner, 'Professor, how have you managed to preserve your life and vigor to such an advanced age?' 'By temperance,' replied the Professor; 'I drink no alcohol. I eat no meat, and do not use tobacco.' " This set Senator Depew to thinking, with the result that he gave up tobacco and beefsteaks.

Twenty Cigars a Day

"I used to smoke twenty cigars a day," said the Senator, "and continued to smoke

them until I became worn out." What was it that wore him out? He confessed it was not running the New York Central Railway, of which he was president. Nor was it attending to his duties as United States Senator at Washington. It was nothing more nor less than the habit of smoking. "One day," he said, as he told the story, "I said to my cigar, The time has come for us to part. I gazed sadly and longingly at it, then threw it into the street." One day, later on, he bought a cigar, smoked it a few minutes, then looked at it and said, "You are the cause of all my ills," and he threw it away again, and since then he has not smoked—and he renewed his youth and activity. Think of the years of life and the vital energy thrown away in foolish indulgence.

Observations of a Physician

We might go on naming men of eminence in public life who have discovered the ill effects of using tobacco, and who have discarded it because of the tremendous handicap which it imposes in the race for success, but in order to show you just how dangerous

tobacco realy can be I wish to give you a case or two from a list of twenty-four similar cases recently cited by an English physician—cases, many of them, that had come under his personal observation:

Smoked to Death

“Case I was a man aged 55, an abstainer from alcohol, and exemplary in all his habits except—he smoked and chewed tobacco excessively. He called for medical advice January 27th. He had been at work until two days before, when he fell ill. At first he vomited and felt pains in the back. I found the pulse weak, 128, and he was weak and shaky and unfit for work. I put him on his club, and gave him medicine. He came again on February 3d; heart sounds were feeble, pharynx injected, urine thick. He promised to give up smoking. On February 5th, after walking one mile, the pulse was 112; he complained of weakness in legs, vertigo, palpitation, and nausea. It was evident he was suffering from mild influenza, plus chronic tobacco poisoning; he remained under treatment for three months, abstaining entirely

from tobacco. The heart gradually recovered its tone. On April 29th pulse was 96; he returned to work in May; in June he was doing well, with pulse 88, cord-like.

Recovered When Discarding Tobacco

"Case IV was a young man of healthy appearance, aged 25, a carpenter, who had recently fainted in the early morning, immediately on rising from bed. This happened twice within a short time. I found no sign of disease, and on questioning him as to his habits I found he was a cigarette smoker. I advised him to break off the habit. Such cases as this occur to most practitioners, and they prove that the heart is liable to serious disturbance, even in strong men. This man took my advice and has since been in good health.

"John Cairns was a Sheffield fitters' laborer, who although warned by his doctor that cigarette smoking was doing him serious physical harm, was such a slave to the habit that he only desisted from the excess for a few days. While he was hurrying to fetch a doctor to attend his sister he fell dead in the

street. At the inquest the jury's verdict was based on the medical opinion that death was immediately due to violent emotional excitement, aggravated by excessive cigarette smoking."

Tobacco Banned by Many Men of Attainments

The use of tobacco is certainly decreasing among men of science and culture, who in general appreciate more than do others the importance of physical habits in relation to mental efficiency. Oberlin College sets a splendid example in excluding tobacco and tobacco users from its walls. The president and professors are all non-smokers, and students are not permitted to smoke.

Prof. E. G. Lancaster, of Olivet College, daughter of Oberlin, and his colleagues are non-users of tobacco and oppose its use. Notwithstanding the fact that their president smokes, only forty per cent of the students of Yale are smokers, thangs to the example and teaching of such men as Prof. Irving Fisher, head of the department of political science, who most earnestly opposes the use of tobacco in any form.



Combating Neurasthenia



Combating Neurasthenia

NEURASTHENIA is not a disease, but a complex combination of symptoms, the general cause of which is nerve poisoning.

In the first place the body is saturated with poisons which lessen the natural energies of the brain, rendering the brain cells less acute and less capable of mental effort. These poisons are very frequently produced by meat eating, though they may be the result of excessive eating of any sort, especially in sedentary persons who do not exercise sufficiently to burn up the food material which they take in. For it should be remembered that a sedentary person, no matter how hard he works his brain, consumes in work only three-fifths as much food as does the man who engages actively in muscular pursuits. If he eats as much, the two fifths excess which he takes into his system is rapidly converted into wastes, cinders, as it were, which poison and cripple every tissue, exercising their pernicious influence upon

the brain and nerves, particularly as shown in depression of mind, irritability of temper, confusion of thought, inability to concentrate the mind, indecision, despondency, and other characteristics of neurasthenia.

Indigestion and Nervous Exhaustion

Indigestion is another very frequent cause of nerve exhaustion. Bouchard has shown by incontrovertible evidence that the changes which often take place in the stomach and intestine, when in a state of indigestion resulting in fermentation and putrefaction, give rise to poisonous substances which, when absorbed into the body, may produce effects entirely similar to those produced by strychnia, opium, alcohol, and other well-known drugs. When food is retained in the stomach beyond the normal time, either because of its indigestibility, or too large a quantity, or a crippled state of the stomach, these changes are certain to take place. This fact explains a very large share of the myriad symptoms which afflict the neurasthenic. The giddiness, the tingling sensations, the confusion of thought, and often mental incapacity, which

are not infrequently observed for several hours after meals in chronic dyspeptics, are due to this cause. Here is the explanation of the irascibility, the despondency, the pessimism, the indecision, and various other forms of mental perversity, and even moral depravity, sometimes developed in persons least expected to exhibit such traits of character.

Popular Beverages Ruin Nerves

Alcohol, tobacco, tea, and coffee are also vicious poisons which exert a paralyzing influence upon the nerves. Alcohol, for instance, renders a man temporarily insane by paralyzing certain of the nerve cells, so that the brain is unable to form correct judgments. Irregular and unnatural combinations of ideas are formed, often with the most disastrous results. A man who naturally is peaceable, under the influence of liquor becomes violent, destructive, a veritable beast in ferocity. In the disease known as delirium tremens the nerve contacts become curiously mixed up, so that the sufferer sees snakes, reptiles, and all sorts of monsters and strange shapes be-

fore him. Such a patient once mentioned to me that he saw a sheep with a huge proboscis like an elephant, and chickens with enormous heads and jaws like crocodiles, with their mouths wide open and rushing at him. These facts forcibly impress upon one the evil effects of alcohol, tobacco, and other poisons which paralyze the nerve cells, destroying those cell groupings which are necessary for the maintenance of health of mind and body.

The Body Like a Furnace

Again, the body is like a furnace. The food that we eat is taken into the body and burned, or oxidized, just as coal is burned in a stove. In the case of the furnace certain gases, the products of combustion, are formed which escape through the chimney. In the same way the products of vital combustion or oxidation escape from the body through the lungs, skin, and other excretory organs. When too large an amount of food is taken, the situation of the body is the same as that of a stove or furnace that is over-crowded with fuel; the combustion being incomplete, volumes of smoke are produced

which choke the fire, and may extinguish it. An excess of food fills the body with organic smoke or imperfectly oxidized waste substances, of which uric acid is the best known representative, and of which rheumatism, neurasthenia, or nervous prostration, neuralgia, nervous headache, bilious attacks, apoplexy, paralysis, and various other disorders, are the natural results.

A Factory of Poisons

The body is a factory of poisons and if these poisons, which are constantly being produced in large quantities, are imperfectly removed, or are produced in too great quantity, as the result of over-feeding, the fluids which surround the brain cells and all the living tissues are contaminated with poisonous substances, which asphyxiate and paralyze the cells, and thus interfere with their activity. This fact explains, in part at least, the stupidity which is a common after-dinner experience with many persons, and which, with some people who are habitually gross eaters, is a confirmed, ever-present state.

A brain which receives impoverished blood



is hampered in its activities. A brain surcharged with blood is, on the other hand overexcited. The result is likely to be sleeplessness and irritability, and other symptoms of neurasthenia. If the blood is charged with irritating substances, the organs through which it circulates will be naturally exposed to abnormal irritation, excitation, and disturbance of function. A brain which receives too large a supply of blood must suffer first and most in this regard. Whatever is taken into the stomach and absorbed enters the blood and circulates through the body. The odor of nicotine which hangs upon the breath of the smoker and the alcoholic odors which emanate from the body of the inebriate for many hours after he has ceased drinking, are evidences of this.

Relieving the Nerves

Now as to means of relieving this condition. First, the neurasthenic must eat carefully and take no stimulants of any kind. And —a matter of very grave importance in this connection—he must so regulate the bowel movements as to take care of the waste ma-



terials which have accumulated. This does not mean once a day, but three times a day. When food is introduced into the stomach a peristaltic wave is set up which travels the entire length of the alimentary canal, and which, when not thwarted, unloads the waste materials from the body.

In making observations of these movements Doctor Cannon, of Harvard University, studied the action of the alimentary canal in a cat by means of the X-ray. He watched the food pass from the stomach into the alimentary canal, and from the alimentary canal into the colon. Here he found two movements. One was a constant movement from the middle of the colon upward, the purpose of which is to retain the fluid portions of the food in the cecum until absorption has taken place. The second movement came at regular intervals and was a downward movement, larger and stronger than the other.

Colonic Cleanliness

When the unusable residues finally reach the lower part of the colon, they should be

promptly expelled; if this is not done, the result is constipation, the worst evil that afflicts humanity, the most dangerous of all forms of intoxication the body knows. We might, indeed, call constipation a veritable Pandora's box of mischiefs, for malignant germs, scores of varieties of them, thrive there, each kind producing its particular poison, and making possible a great variety of symptoms of chronic intestinal activity. Professor Bouchard has shown that often the contents of the intestines consist of one-half bacteria, and these poisons, which are retained in the body, affect not only the skin, which becomes tainted and discolored, but also the nerves and the brain, the very seat of neurasthenia.

Dermic Cleanliness

Neglect to bathe the skin, allowing it to become foul, is considered a hideous and unhealthful thing—an unclean covering skin is far less objectionable than a foul inside skin. The body, remember, is merely a double tube with a covering skin and an inside skin—the lining of the alimentary canal. Now, if the covering skin becomes foul, much of the im-



purity is cast off—by perspiration and in various other ways; but if, on the other hand, the lining skin is allowed to become foul, the impurities are absorbed into the blood and the body is poisoned.

In order to remove neurasthenia, you must clean up the body and keep it clean. A man once came to me and said, "Doctor, tell me just what to eat. I want to be cured, and if you tell me to eat sawdust, why, I'll eat sawdust. I will do just what you say for three weeks; but at the end of that time I want to get back to my regular life." There is no hope for that sort of a neurasthenic. He has not yet reached the point where he is willing to be cured and stay cured. The most important thing for the neurasthenic is to be delivered from bad habits—from cigars, from tea and coffee, from beefsteaks—and to train the body into a condition in which it will throw off the wastes that are constantly accumulating.

The Body Filters

In this connection let me caution you to remember that when the bowels are not active

the kidneys have to carry off a great many of the poisons which accumulate in the colon, with the result that these delicate filters are ruined. How long, think you, would a Pasteur filter remain intact if every day a quantity of filth were poured into it?

The kidneys are delicate filters, and in loading them down with poisons that come from putrefaction we ruin them. A man in perfect health, with sound kidneys and a sound liver, may be able to tolerate these poisons for a long time, but he is constantly undermining his health, and will reach the time when his body will not stand the damage any longer. Like a battleship on fire—the fire burns and continues to burn, but after a while it gets to the magazine and the ship blows up. So it is with the man who goes on with his bad habits — eventually the disease processes reach the vital point and he collapses.

Life and the Liver

Life and the Liver

More people complain about their livers than about any other organ of the body, when, as a matter of fact, of all the organs of the body the liver is almost the least worthy of blame. It is the most untiring in its efforts to preserve our lives; it is the most industrious; and, aside from the brain, it is the most wonderful and the most mysterious organ of the body. It carries on a large number of activities. It secretes, it excretes, it creates, it destroys, it tears down and builds up. It seems to be a sort of jack-of-all-trades in the body, and an expert in every one of them, and yet the most powerful microscope reveals in its simple structure no hint of this marvelous diversity of function.

Bile-Making Functions of the Liver

One of these many functions that the liver performs is the making of bile, of which it produces from sixteen to twenty-four ounces every twenty-four hours. Bile is one of the

most poisonous of body wastes and needs to be eliminated from the system as speedily as possible. It is composed not only of alkaline wastes, but also of bacteria which have been removed from the blood, and of various poisonous substances which may have been taken into the stomach with food or drink. It serves a number of useful purposes, being an antiseptic, a laxative, an aid to absorption, and prevents the acid gastric juice from digesting the small intestine by neutralizing its acrid acid.

The Manufacture of Glycogen

Glycogen, one of the essentials of life, a substance needed by every living cell, is another product of the liver. Glycogen is a product of sugar brought to the liver from the intestine by the portal vein. This sugar, however, is not the ordinary cane sugar with which we are familiar, but a fruit sugar formed by the digestion of starch. In diabetes this function is disturbed; the body gradually loses its power to store glycogen, and death occurs.

Waste substances produced by the work

of the body or by putrefaction in the intestines, or that have been taken into the body with food such as uric acid, are in part converted into urea by means of special ferments which are formed by the cells of the liver. The discovery of this important function of the liver explains the zoological fact that carnivorous animals, and especially scavenger animals, have extraordinarily large livers. A dog has a liver four times as large as that of a man in proportion to its size, because it has so many of these poisons to take care of. If man had a liver as large in proportion as that of a turkey buzzard, there would be no room left for the other organs of the abdominal region. Large meat eaters compel their livers to do three or four times as much work as is required with a low-protein or non-flesh dietary. It was on this ground that the late Professor Dujardin-Beaumetz, of Paris, forbade the use of flesh foods of all sorts in all cases of disease of the liver and kidneys.

In recent times it has been demonstrated that the vital processes of the body have two quite independent sources of regulation—the

nerve centers, on the one hand, which send out exciting and controlling nerves, and, on the other hand, internal secretions which act in relation to such great functions as muscular activity. The action of every muscle, of every gland, probably of every cell, is controlled by these remarkable and subtle substances, of which many eminent physiologists believe the liver is the chief source. It is readily apparent, then, how great must be the disturbance of the vital machinery when through any cause the functions of the liver become deranged, as in the condition commonly known as "biliaryness." This term, while not scientific, is nevertheless significant in that it suggests a disturbance of the bile-making organ, which is in a condition of enormous overwork and inability to meet the extraordinary and unnatural demands made upon it.

The Liver a Life Preserver

Every person is indebted to his liver for rescue from speedy death. This marvelously versatile organ has power to destroy poisons. If a person drinks water containing lead, or eats peas or pickles colored green with cop-

per, the liver seizes upon the poisonous metal, and after discharging as much of it as possible through the bile, gathers the remainder up in its cells, thus preventing the circulation of the poison to the rest of the body. When a person is found suffering from metal poisoning, the fact is evident that the liver has been seriously damaged; otherwise other organs would not have suffered. The smoker, the user of alcohol, and the opium slave would have suffered death from the first indulgence in the poison were it not for this marvelous function of the liver. Tea and coffee, too, are active agents in causing premature breakdown of this important vital machine; and the same must be said of condiments, mustard, pepper, capsicum, spices, vinegar, hot sauces, and the use of chemical substances in bread making. All of these substances should be carefully avoided, unless one wishes to die prematurely.

A brief study of the physiology of the liver and its relation to the circulation of the blood will explain the manner in which this protective function of the liver is performed, and emphasize the importance of not overtaxing

it by the use of poison-producing foods and beverages, and irritating spices and condiments. First let us examine the heart.

The Systemic Circulation

Now the human heart is really not a single organ, but a double heart—a left and right heart, as will be seen from the illustration. Some animals have three or four hearts located in different places, but the human system has but one, divided into two sections—as we have said, the right and left heart. The left auricle and left ventricle pump the pure blood through the aorta into the arteries and capillaries in all parts of the body, where it is gathered up by the veins and carried into the vena cava, the large central vein that carries the impure blood back to the right heart. This is known as the "systemic circulation."

The Pulmonary Circulation

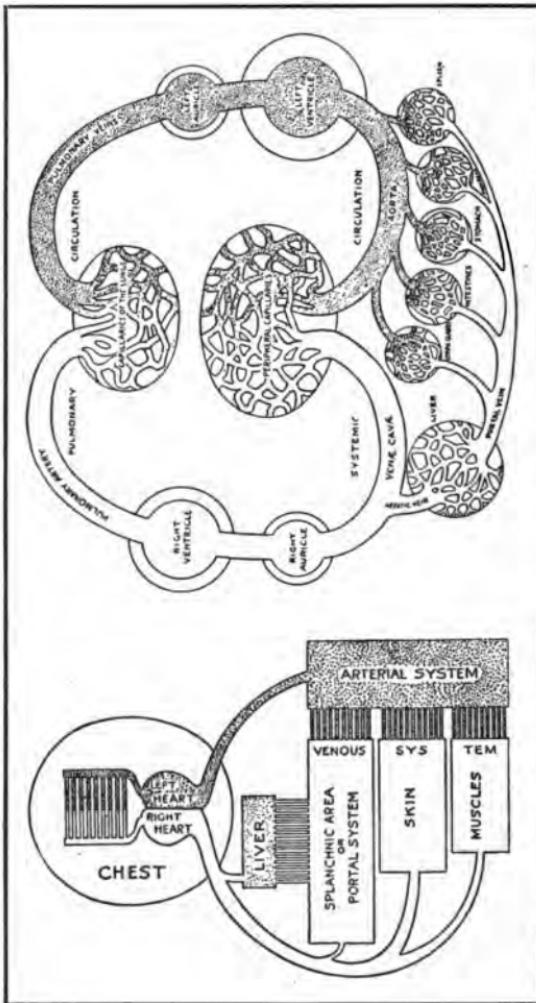
By the right heart the blood is pumped into the pulmonary artery, whence it is carried to the lungs. The blood now circulates through all parts of the lungs, becoming oxygenized

and freed from the impurities which it has picked up in its journey from the left heart. From the lungs the blood travels by way of the pulmonary veins back to the left heart, whence it is ready to set out again on the journey of the systemic circulation. This circuit, from the right back to the left heart, is called the "pulmonary circulation."

Portal Circulation

The most interesting part of the story has yet to be told, however. Part of the blood, after it leaves the left ventricle, leaves the systemic circulation and is distributed to the stomach, intestines, pancreas, spleen and other organs. From these various organs the blood is conveyed by a large vessel, known as the "portal vein," to the liver, where it is filtered, as it were, and the grossest of the poisons from the organs just named are removed. In this way all the materials absorbed by the veins of the stomach during digestion are submitted to inspection before being allowed to enter the general circulation.

From the liver the blood is carried to the "ascending vena cava" by means of the he-



At the right is shown in graphic form the three circulations: the "systemic," "portal" and "pulmonary." The illustration at left shows the two hearts, the reservoir-like capacity of the arteries, and the capillary system through which the blood must be pumped before it reaches the right heart and the pulmonary circulation.

patic vein, and is then carried to the right heart. This circulation of the blood through the stomach, intestines, pancreas and spleen is known as the "portal circulation."

Great Importance of the Portal Circulation

Now the integrity of the portal circulation is of the utmost importance. All the poisons which the blood carries from the stomach, the spleen, the pancreas, and the intestines are carried by the portal vein into the liver—poisons, that is to say, which have been absorbed from the stomach and other organs, and poisons that have been ingested with the food and drink. The most vicious of these poisons the liver destroys; the others are carried on by the blood into the hepatic vein, which returns it to the systemic circulation.

The Liver an Indispensable Organ

This destruction of poisons by the liver is one of the most important processes in the entire body. People have been known to live without a stomach, and still others with but one kidney, while portions of the intestinal canal have been removed without any ap-

preciable effect on the patient; but remove any portion of the liver from an individual and he will be fatally poisoned by the toxins which enter the general circulation without being filtered out.

Biliousness Means Autointoxication

Now there are many people who suffer from bilious attacks. Their livers have been crippled to such a degree that it is almost as much disabled as if the operation had been performed. The bilious attack means simply poisoned blood—in other words, autointoxication. The poisons of autointoxication are the most deadly that are introduced into the body.

Now if a butcher cuts his finger with a knife with which he has been cutting meat, he may die of blood-poisoning, but he can take an equal amount of the same poison into his stomach and it will not kill him, because the liver takes care of these poisons.

The Measure of the Heart's Work

Now, in order to be effective in its work of removing impurities from the body, the blood

must have an uninterrupted flow through all the blood-vessels. The blood after leaving the left ventricle, passing from the aorta, enters a vast network of fine capillaries before it empties again into the vena cava. Again, the blood must traverse a vast capillary system before the blood passes through the pulmonary circulation back to the left heart. To propel the blood through the blood-vessels of the body, the heart pumps night and day without any rest, except what it gains between beats. Thus, the total amount of work done by the heart in twenty-four hours in its contractions, in an average man, is about one hundred and twenty-four foot-tons; that is, it is equivalent to lifting one hundred and twenty-four tons one foot high, or lifting a one-hundred pound weight one foot high 2,480 times, or at the rate of about four times a minute for a period of ten hours.

A Force Pump

The heart, indeed, is in effect a force-pump, as will be recognized by the second of the two pictures. The "arterial system" is

a great reservoir into which the heart is constantly pumping blood with a force that is constantly maintained. From the arterial system the blood passes through the capillaries (indicated in the illustration by fine horizontal lines) into the venous system (represented in the illustration at the left by the sections labeled "skin and muscles") and into the portal system. The venous blood of the skin and muscles is carried directly to the right heart, while that of the portal system, or "splanchnic area," has to pass through the liver for the removal of its poisons.

Elastic Arteries

In view of the constant pressure of the blood exerted by the action of the heart, the importance of keeping the blood-vessels elastic and healthy is very apparent. With each beat of the heart the vessels are distended by the flow of blood. If, however, they become hardened so that they do not give, the blood does not readily press its way through, which, especially in the case of the arterial system, creates an abnormal pressure that results in increasing degeneration of the vessels, with

ultimate rupture of the vessels or heart failure.

Causes of Arterial Hardening

There are various causes of degeneration of the arteries, or arteriosclerosis, the most common, perhaps, being wrong habits of eating—the use of tobacco, alcohol, tea and coffee, and meat and other foods rich in protein, charging the blood with poisons which irritate the walls of the arteries and veins and encourage a condition which leads to arteriosclerosis. Other poisons and irritants which should be omitted from the dietary are spices and condiments of every kind. It has been said, indeed, that arteriosclerosis commences by poisoning, continues by poisoning, and ends by poisoning. This poisoning, according to Huchard, is generally due to errors in diet. This is well shown by the fact that the toxic dyspnea—a form of asthma which accompanies intestinal autointoxication—disappears very quickly on the adoption of a non-flesh dietary. An interesting observation of Huchard's is the fact that in many cases of intestinal autointoxication there is an increase

of blood-pressure. These cases were referred to by old medical authors as passive hyperemia of the liver, or abdominal plethora. In these cases there are found enlargement of the liver, bronchitis, and frequently pulmonary congestion and cardiac feebleness. The congested liver is unable to perform its poison-destroying functions. As a result, various toxic substances absorbed from the intestines are distributed by the blood throughout the body, and, coming in contact with the tissues, irritate the walls of the blood-vessels and cause these tissues to thicken and degenerate.

We have pointed out, then, that under the conditions of our modern civilized life, the ordinary mixed diet introduces into the system an enormous number of germs. The poisons produced by some of these germs are identical with those produced by the putrefaction of a dead animal or a decayed egg. In moderate quantities the liver is able to deal with these poisonous products, but its capacity is limited; hence the "biliaryness" which results from constipation, over-eating, and the free use of meats. These bacteria

are constantly passing through the intestinal wall into the veins and thus find their way to the liver. The liver cells destroy many of these, but great numbers often find their way into the gall bladder, causing inflammation of the gall bladder and gall stones.

Constant Care of the Liver Essential

An organ possessed of so many, such delicate, and such wonderful functions, and whose activities are so essential to life and well-being, certainly needs the best of care, even though such care require some restriction of appetite, for foods which, while affording a momentary tickle of the palate or a certain measure of "unearned felicity," may be at the same time making huge breaches in the walls of defense which protects the citadel of human life.

Role of Constipation

Finally, it should be made known that one of the most active, perhaps the most common and most potent of all causes of arteriosclerosis as well as of diseases of the heart and kidneys, is constipation. By the retention of